Gas Journal

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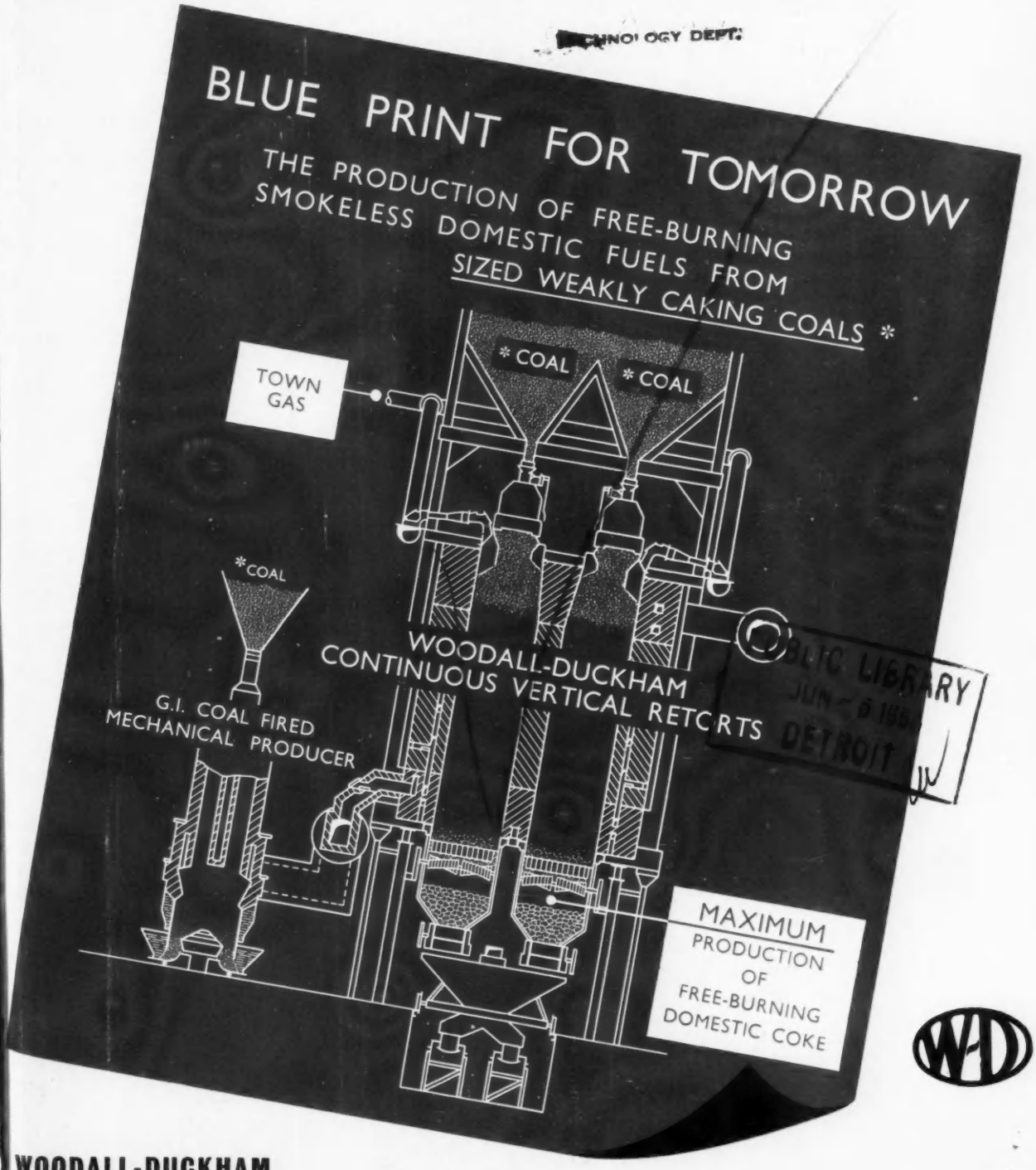
CHNOLOGY DEPT.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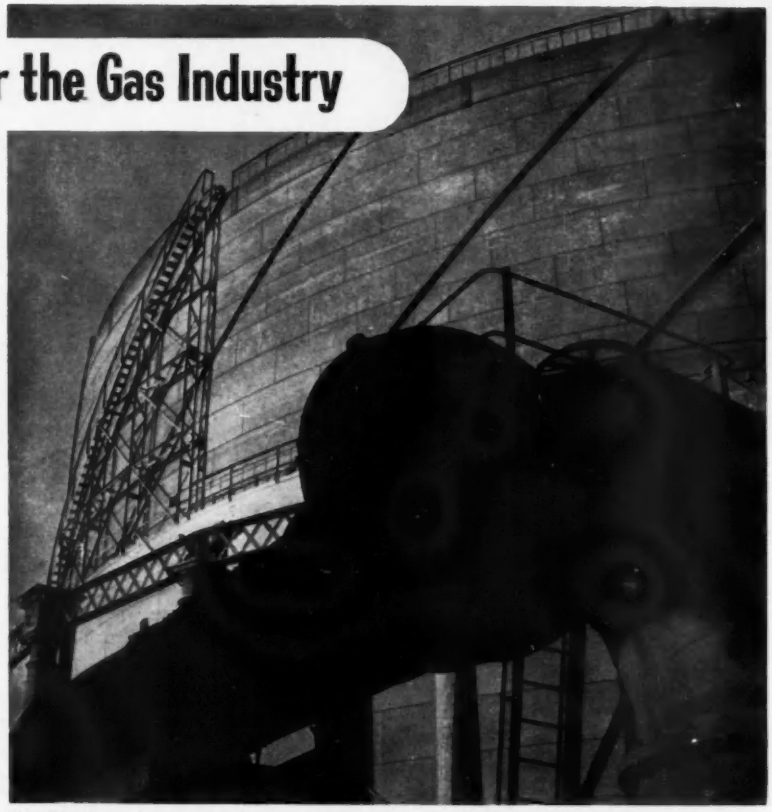

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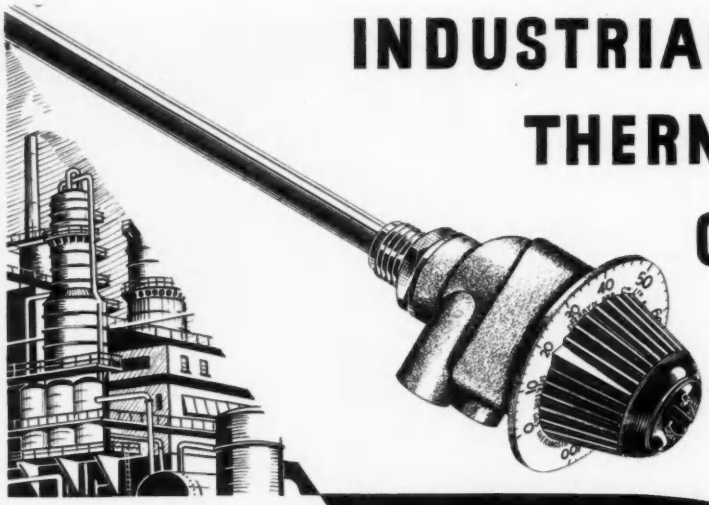

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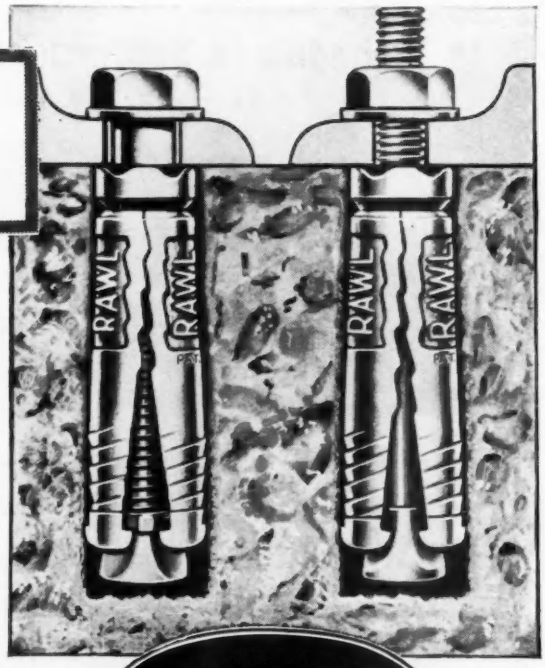

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Photograph by Courtesy of the South Eastern Gas Board, Dover and Woodall-Duckham Construction Company Ltd.

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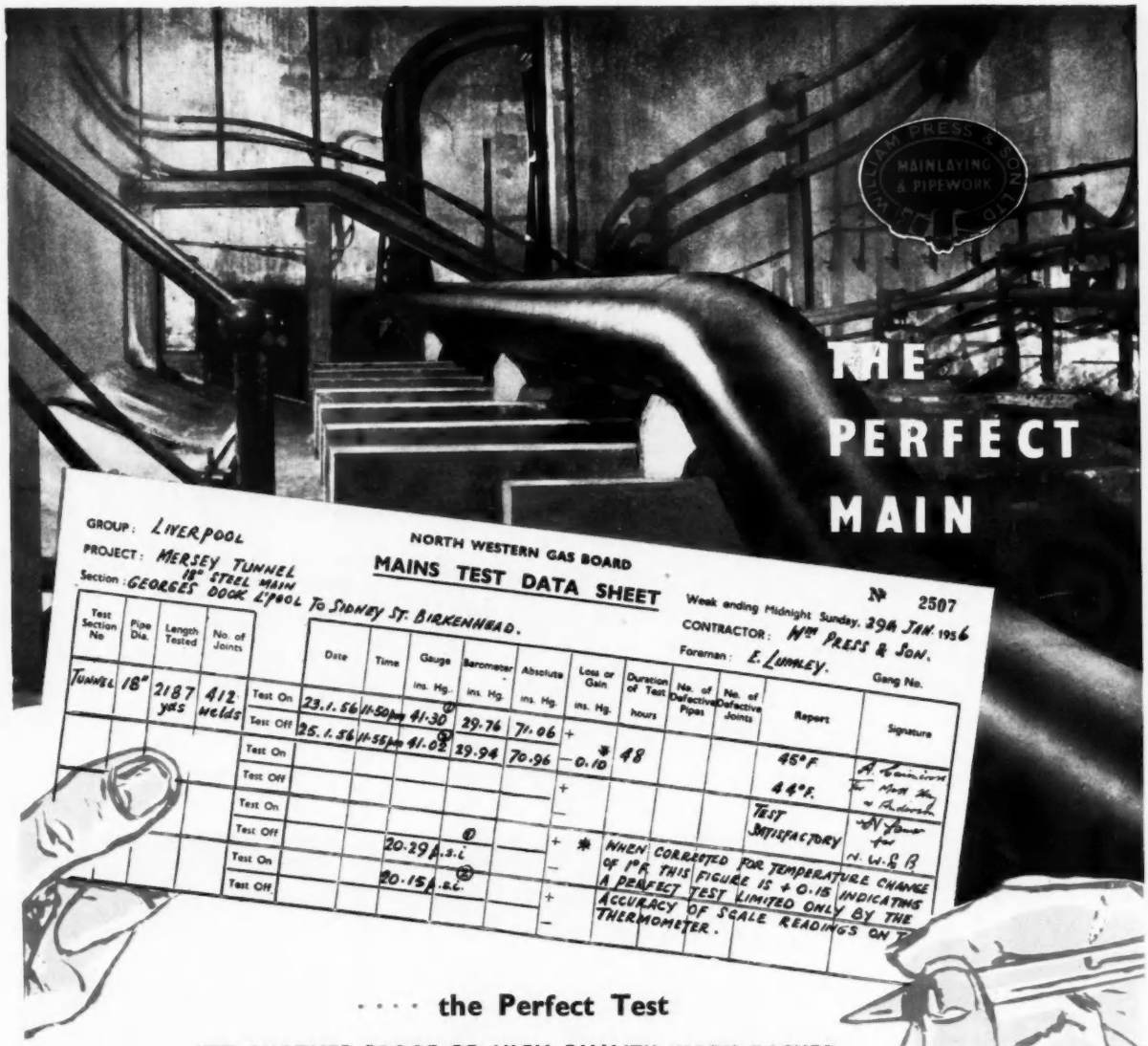
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TUNNEL 18" 2187 yds 412 welds
Test On 23.1.56 11-50pm 41-30 29.76 71.06
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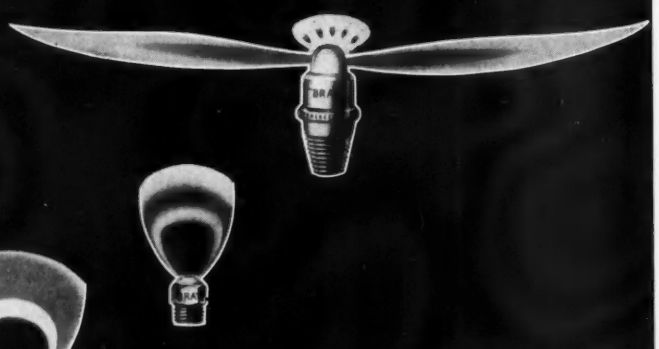

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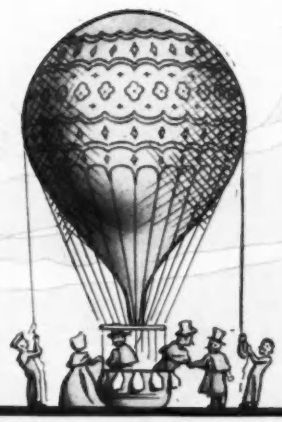
WE ALL DEPEND ON GAS



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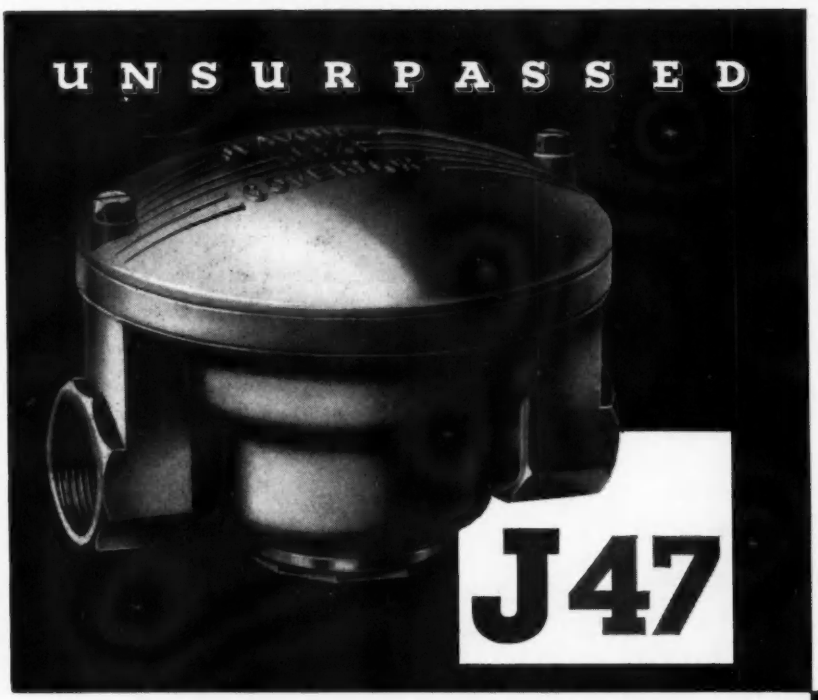

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Putting the horse before the wagon

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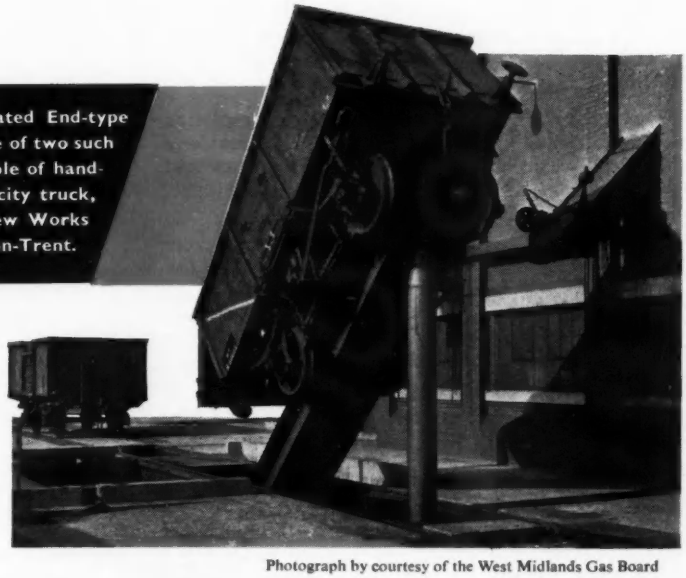

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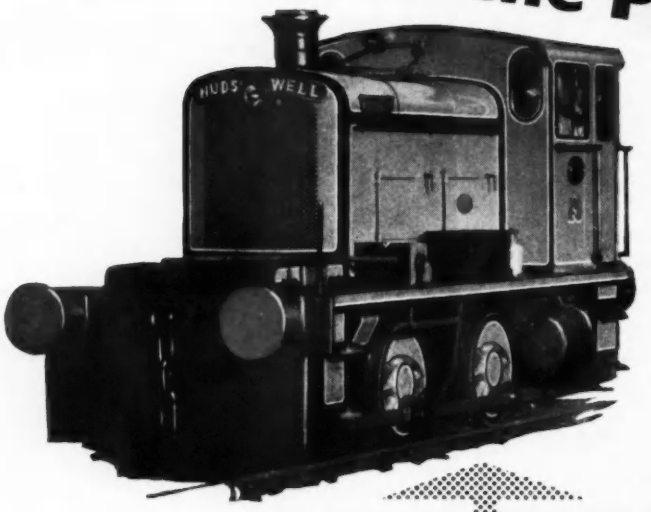
Photograph by courtesy of the West Midlands Gas Board

Members of the Society of British Gas Industries

at work in the Port of Bristol
(PORTISHEAD)



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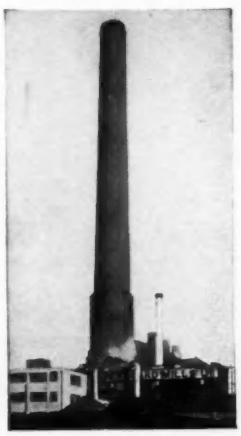
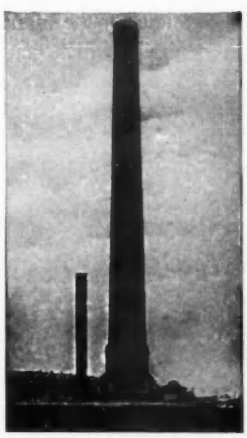
Left : Trial borings for reconstruction of Coventry Cathedral.





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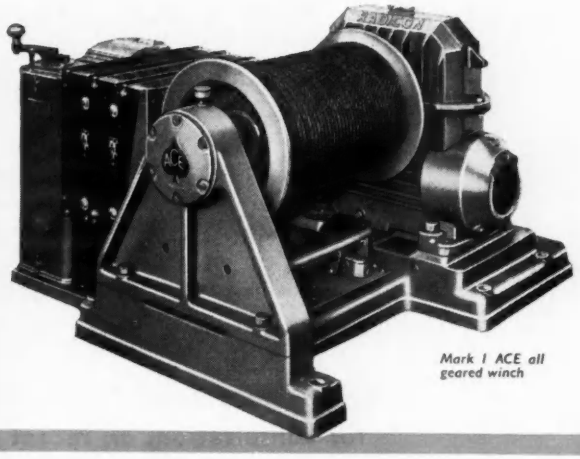

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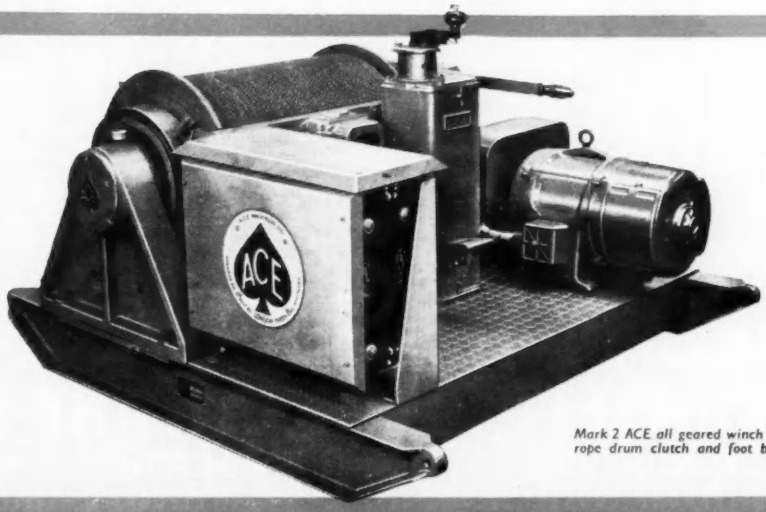

Mark 2 ACE all geared winch with rope drum clutch and foot brake

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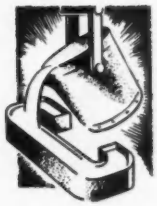

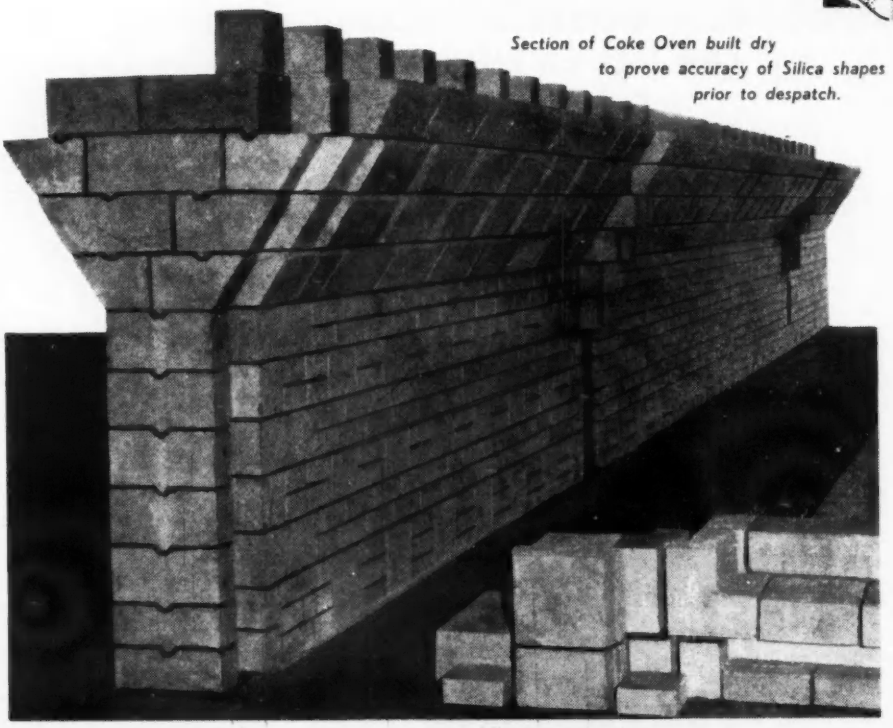

Section of Coke Oven built dry to prove accuracy of Silica shapes prior to despatch.

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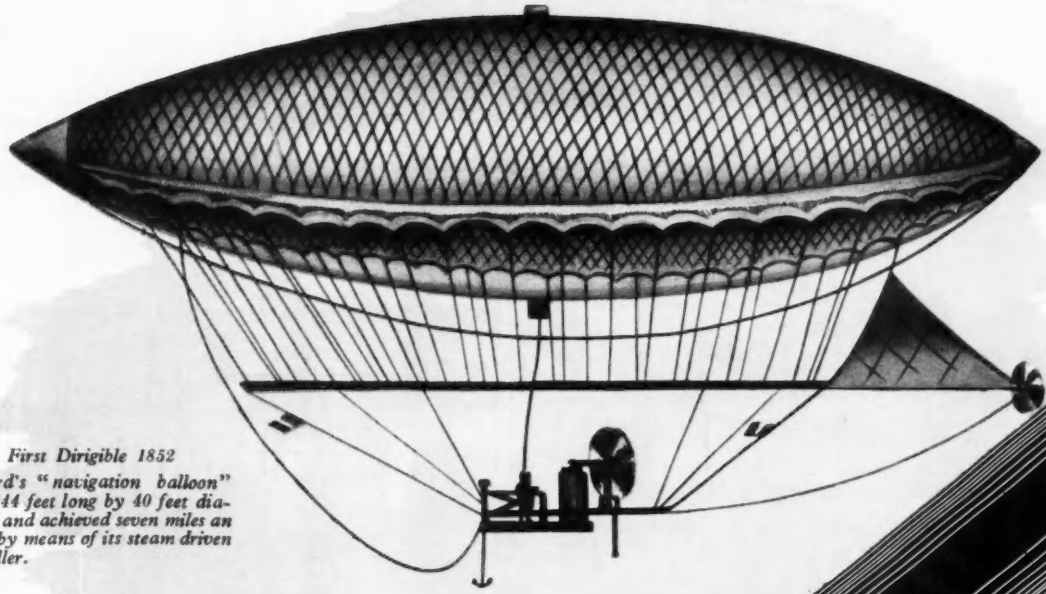

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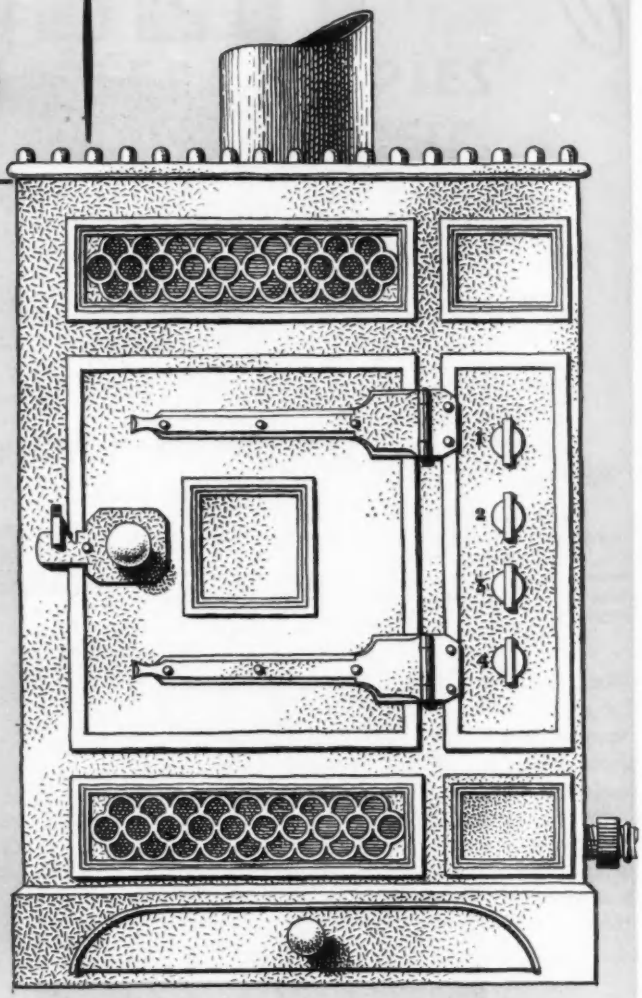

The Liverpool Gas Cooking Range, designed by Alfred King, about 1850

Frederick Windsor, founder of the National Light & Heat Company, (forerunner of the Gas Light & Coke Co.) claimed to be the first to make it feasible to "cook, melt, boil and distil by a gas fire, either in a kitchen or dining-room". But there is no evidence that he ever made good this claim, and lighting remained the main function of gas for many years.

The earliest experiments in making gas stoves began in the 1820's; Clegg in 1824 saw men at the Aetna Iron works making a primitive type of gas oven. Then in 1841, Alexis Soyer, famous chef of the Reform Club, installed two gas stoves in the new kitchens he had designed for the club.

By 1850, several comparatively efficient gas stoves were on the market. Probably the best was Alfred King's Liverpool Gas Cooking Range, which has the distinction of being the first ever illustrated in an advertisement in the technical press—in the *Journal of Gas Lighting* (now the *Gas Journal*) for 1850, from which this illustration was taken. In the latter half of the century, cookers, heaters and water heaters were all in use.

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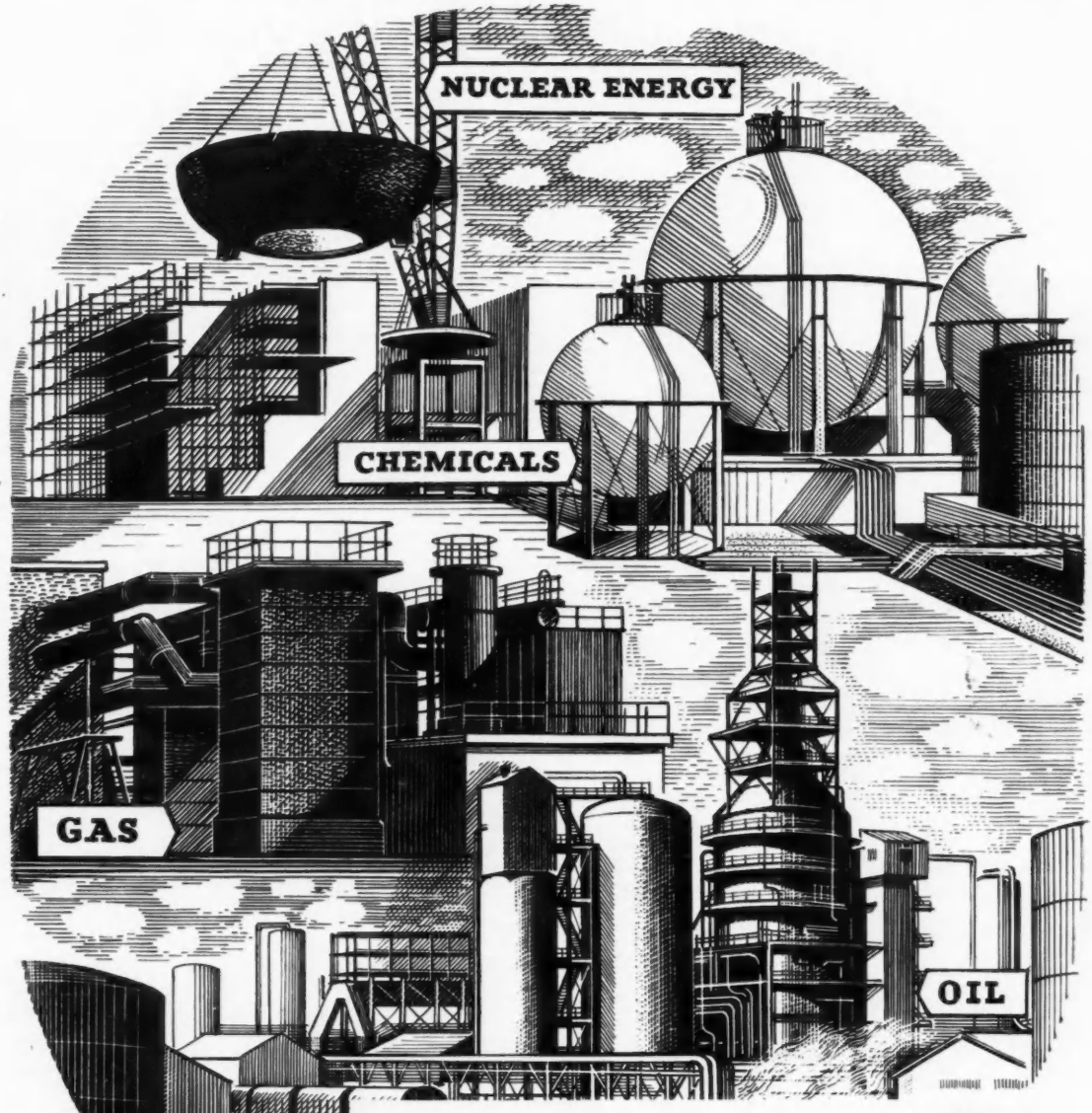

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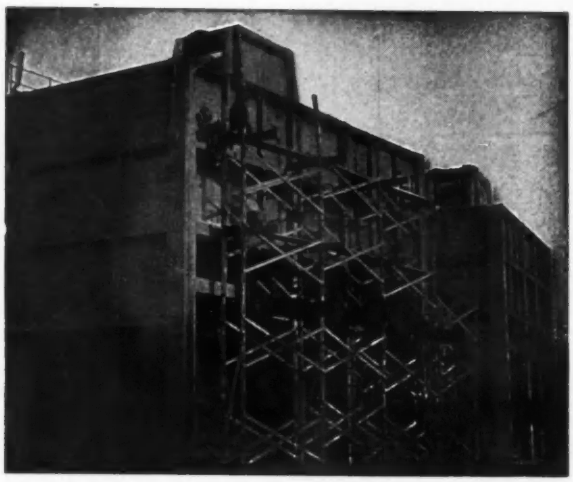

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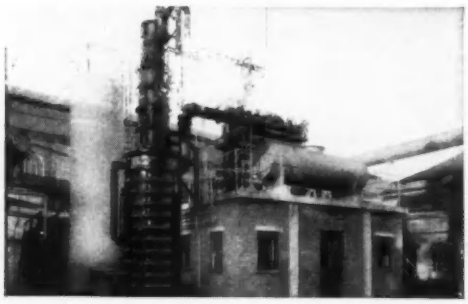

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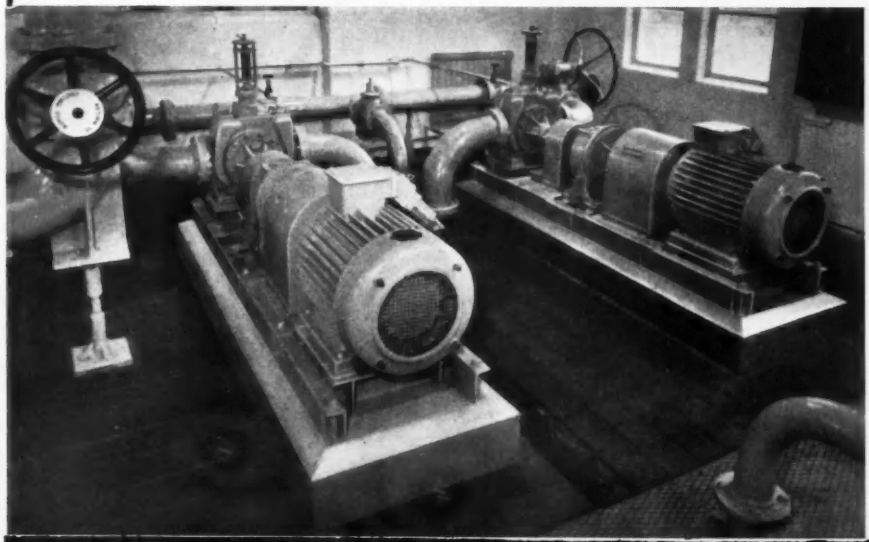

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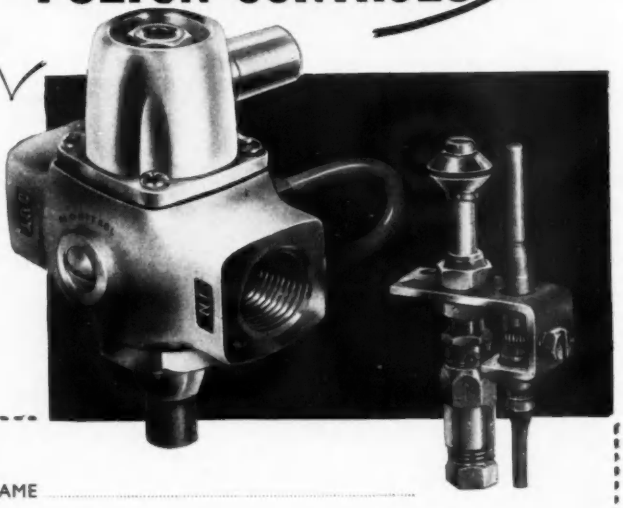

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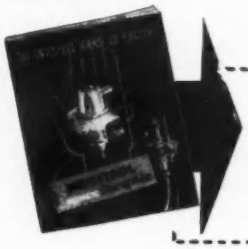

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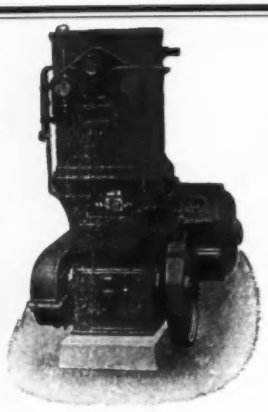

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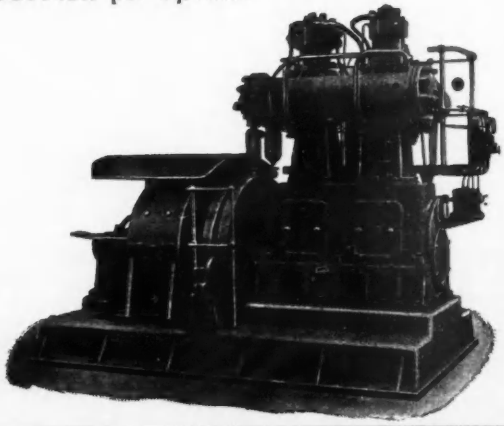

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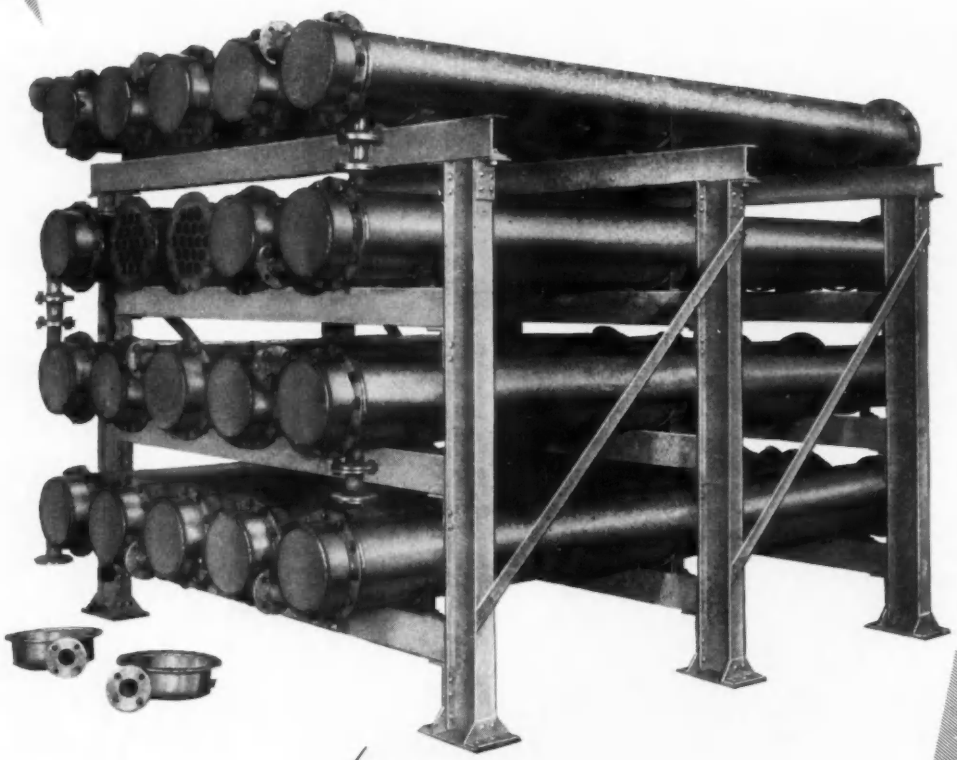

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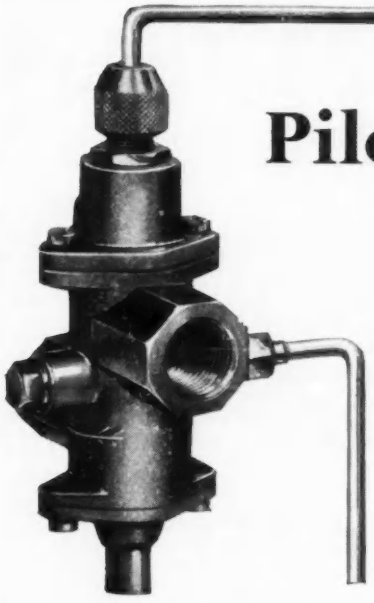

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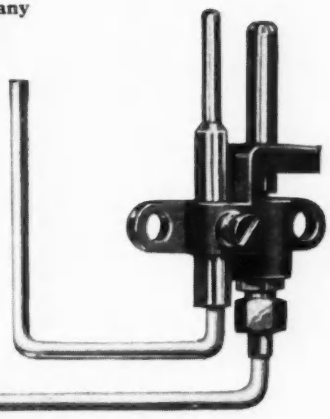

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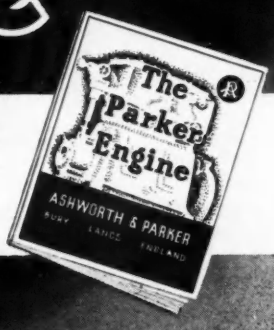

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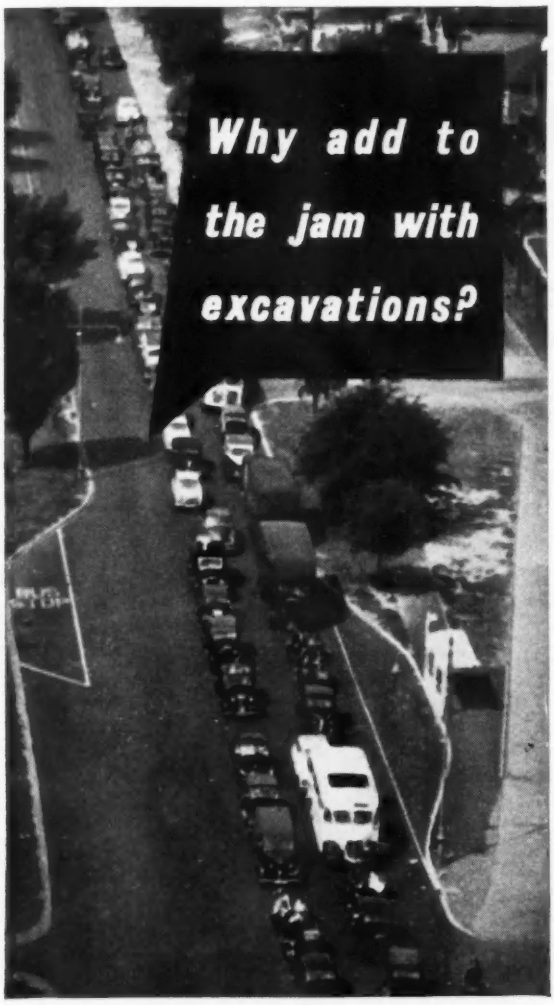

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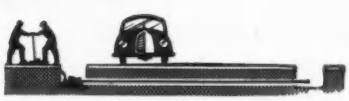

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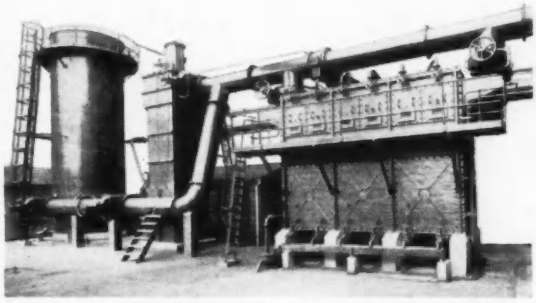
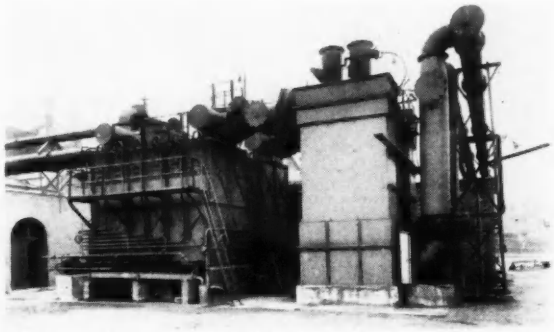
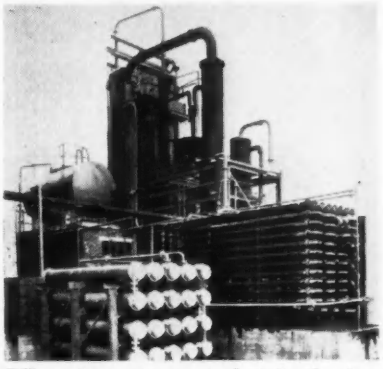


Wet purification plant comprising mild steel condenser, cast iron ammonia washer and plate-type electro-detarrer at Norwich for Eastern Gas Board.



Washers and detarrers at New Wortley for North Eastern Gas Board.



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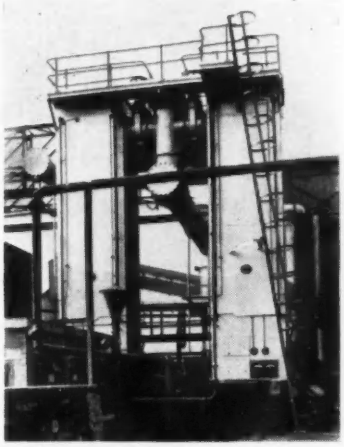
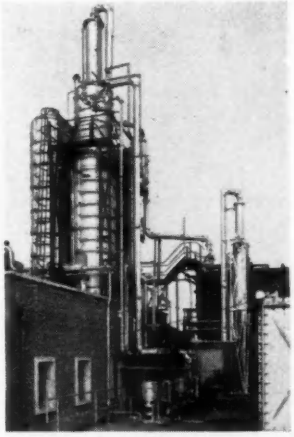
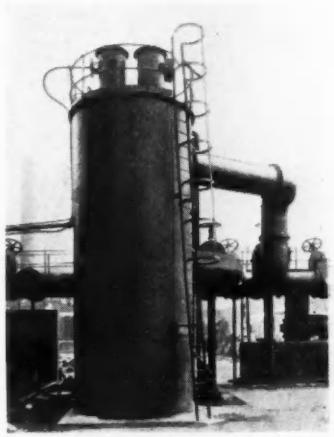


Mild steel vertical water-tube condensers at Bristol (Canon's Marsh Gasworks) for the South Western Gas Board.



Concentrated ammonia liquor plant at Bristol for South Western Gas Board.



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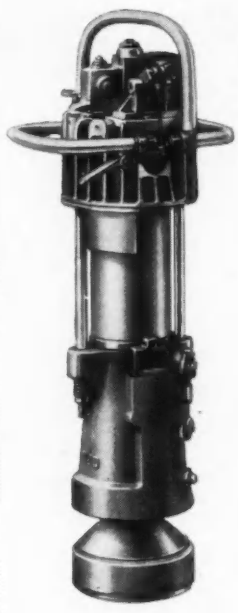

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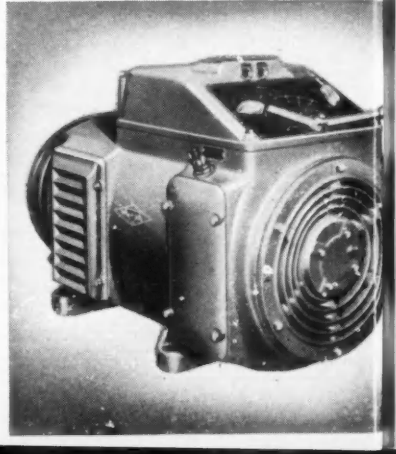

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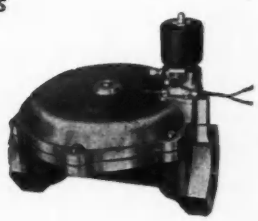

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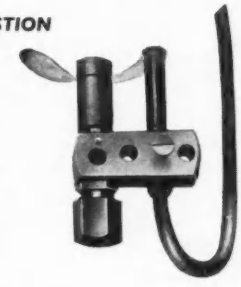

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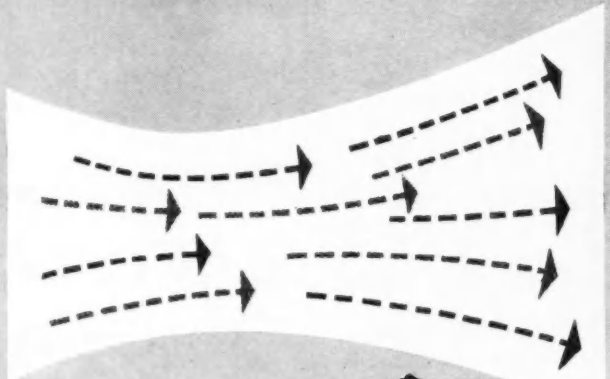

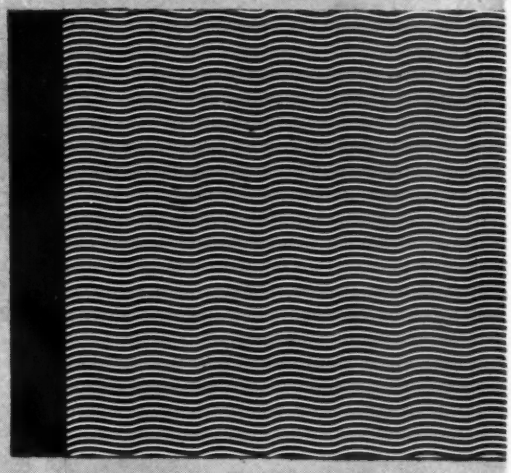

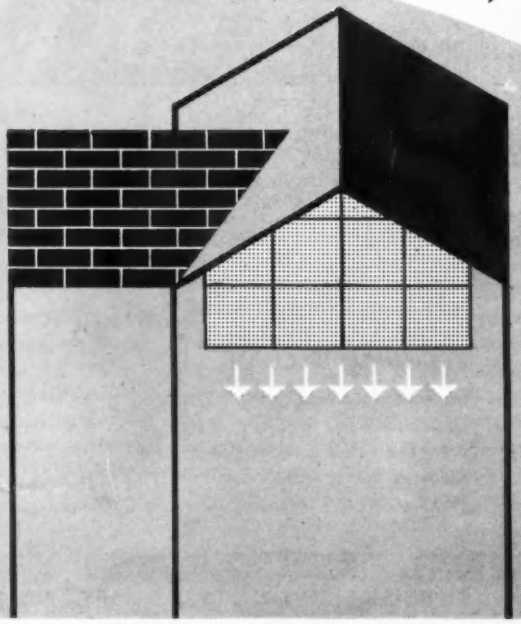

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Gas Journal

VOLUME 286. No. 4844. MAY 16, 1956. 108th YEAR

Control of State Industries

WE have no quarrel with the proposal which is to come before the House of Commons shortly for a select committee to be set up with authority to investigate the annual reports and accounts of the Gas Council and area boards, the National Coal Board, the Central Electricity Authority, and the responsible bodies of various other nationalised industries. The terms of reference of the proposal were drawn up by the Leader of the House, Mr. R. A. Butler, after consultations with Ministers having any measure of responsibility for nationalised industries, and in particular the Minister of Fuel and Power, Mr. Aubrey Jones. We may infer, therefore, that Mr. Jones supports the proposal, for which we extend our compliments to him.

It is the Government's hope that such a committee would produce for the House of Commons from time to time valuable reports which, on the days set aside each session for debates on nationalised industries, would form a better basis for discussion than sporadic study by individual members which form the raw material of debates at present. Better results with the same amount of time spent in debate would be achieved than is possible under the present system, the Government argues, and this argument seems unanswerable.

The Government recognizes that the most effective measure of Parliamentary control would be regular debates on all the nationalised industries, or the discipline to which the Post Office, which is directly managed by a Minister, is subjected. But in the Government's view, neither method is practicable. Modern legislative time-tables prevent a more generous allowance of time for debates on the nationalised industries, and the Government does not intend to bring these industries into the kind of direct Ministerial management which the Postmaster-General exercises.

The new terms of reference differ from those which the last select committee reported to be unworkable in that they do not start with a list of forbidden topics and they do include a reference to 'reports' as well as 'accounts.' The new select committee, when investigating accounts, would be dealing with events of the past, but when investigating reports, which normally include a reference to development plans, might manage to comment on future policy.

The idea has arisen that the committee might take the place of the well-established machinery that negotiates wages and conditions of labour, though the select committee would be able to comment on any items in the annual report of a nationalised industry which concerned wages and conditions of labour. This idea Government Ministers dismiss as nonsense.

The services of Treasury officials and of various accounting officers would be put at the disposal of the select committee, which would be given the usual power to send for people, papers and records. The Government proposes that the select committee should be a body of less than twenty members and assumes therefore that it would not work through sub-committees, as the Select Committee on Estimates does.

The Opposition was not consulted in the drafting of the terms, and therefore has had no occasion yet to express either approval or disaproval of them. In fact, the Opposition is unlikely to declare an official attitude before it has discussed the matter with the T.U.C. Labour's attitude is cool if not suspicious. It regards the committee as a sop thrown by the Government to implacable enemies of the nationalised industries on the Tory side and suspects that the committee may be tempted or encouraged to dabble in the preserved waters of wages and labour conditions. The questions which Mr. Herbert Morrison and Mr. Griffiths asked the Prime Minister last week illustrated these alarms.

None the less, several attempts have been made since the war by committees on which Labour members were serving to devise a means of giving the House of Commons a firmer grip on the activities of the nationalised industries without interfering with the day-to-day management of those industries, and without weakening Ministerial responsibility. All these attempts have failed for various reasons. It is to be hoped that a satisfactory solution is now in sight.

Certainly there is very real need for a select committee of this nature which can fulfil its purpose satisfactorily. The great nationalised industries play a major role in the industrial life of the country, and on their efficient supervision—and operation—depends to a very great extent the trading vigour and efficiency of the nation as a whole.

We therefore wish the proposed committee well, and shall hope to see it making better progress than its predecessors. As will be remembered, the first, set up in 1952, did little beyond come to the conclusion that such a committee should exist. The second, set up three

years later, was clearly foredoomed to failure when the general election cut short its ineffectual life. The third, set up also in 1955, quickly came to the conclusion that it was too hedged in by its terms of reference to be able to achieve anything. At least the proposed committee will not suffer the latter fate: It will be hedged in by virtually no restrictions at all.

Gas in Ireland

THE Irish gas industry is going through a particularly difficult period, a fact which was reflected by the views expressed at the meeting of the Irish Gas Association last week. With rapidly rising coal costs—equivalent to an increase of 42s. per ton in Southern Ireland during the past year—the situation is alarming, and assistance from both Governments, Northern and Southern, appears inevitable. There is a particular virtue in this since the industry is a substantial employer and, as the President said in his address, it 'contributes to prevent the drift of population from the rural townships and small provincial communities.'

In a country in which industry and population are of relatively low concentrations, it is not surprising to find smaller units with higher operating costs. Water power provides some 40% of electrical requirements in Southern Ireland, and since water is cheap and its replacement by any other form of fuel for generation must add to its cost of production, if the cost of coal for gas making can be kept at a reasonable level the competitive advantage ratio should not vary. This point was made by Mr. J. W. Young in his paper 'Some Observations on the Smaller Works Practice in Ireland.' Maintaining that the industry might be called upon to provide increasing quantities of chemical coal products and smokeless solid fuels, he also advocated a careful examination of residuals policy and of the small works approach to oil utilization. Throughout all Ireland there are some 48 undertakings serving 500,000 consumers, with works varying from 5,000 mill. cu.ft. down to 4 or 5 mill. cu.ft. per year. In the largest units continuous verticals predominate with C.W.G., but there is one plant of 750 mill. with horizontals and C.W.G. In the medium size undertakings verticals again hold sway, with some C.W.G. or total gasification for peak, and there is a growing tendency towards the admixture of producer gas. Among the smaller undertakings horizontals are normal practice, with an appreciation of producer gas as a practical contribution to flexibility. One undertaking is experimenting with catalytic oil gasification and another distributing all total gasification gas. At the bottom of the list come very small works handling neat butane, and it is interesting to note that some of these are selling butane ex domestic size cylinders through meters in consumers' houses.

Mr. Young's paper, which will be published next week, makes some interesting observations on modern tar firing of horizontal retort combustion chambers, and on producer gas utilization and economics. It is clear that the gas industry in Ireland is seeking new solutions to their problems. As the President said in his address: 'We face a future in which sustained effort and flexible thinking are required and in which the quality of resourceful management will be a decisive factor.'

An Art—or a Science?

IN his Presidential address to the London and Southern Section of the Institution of Gas Engineers, Mr. J. M. Webber discussed a subject which is always of great interest to station engineers. How should a gasworks be staffed to give the station engineer the greatest possible opportunity of getting the management of the works, its future policy, and its day-to-day running in their proper perspective? Mr. Webber considers the management of a gasworks, like any other similar organization, is at least as much an art as a science. This we think is true, but it depends so very largely on the organization behind the chief executive, his choice of subordinates, and their attitude to their share of the management as a whole.

It seems that Mr. Webber has the Army chain of command very much at the back of his mind, when he describes how he would organize a gasworks on these lines. The station engineer is undoubtedly the commanding officer and should have all the standing and respect due to anyone holding so responsible a position. He carries the ultimate responsibility of any decision made by his subordinates, and at the same time must be ready to put into effect the policies or 'strategies' of his superiors. Like any other commanding officer the station engineer must have his second-in-command and his adjutant. Mr. Webber suggests that the equivalent of these two officers in gasworks management should be the chief assistant engineer and the personal clerk. The former, like his Army counterpart, is responsible for 'training,' and here he uses the assistant engineers as his immediate agents on the works, who in their turn will work through that most valuable of all men on the spot, the senior N.C.O., the foreman on whom the actual carrying out of an order ultimately depends.

The comparison with the Army is interesting, but it can only show the outline and general structure of how such an organization as gasworks management or any other civilian enterprise can be run. It is the development of detail which makes a demand on the character of the station engineer, and the way his subordinates are handled which constitutes the art of management.

The personal clerk should not be confused with the private secretary. One would think of a private secretary as almost certainly a woman, young or otherwise, able to type and keep her boss to his engagements. The personal clerk, in Mr. Webber's mind, is none of these things. 'To have on the staff an intelligent clerk who has, on appointment, a general idea and no more of the rudiments of accountancy and engineering . . . . If he is the right man he will soon acquire a good grasp of the job and will after a year or two, without pretending to perform the functions of either an engineer or an accountant, develop an eye for the things that matter. . . .' He will in fact keep the station engineer informed of all the important things coming into the office, the working results, costs, etc., coming from head office, or important returns, the information for which is constantly coming in from the works. The station engineer's second-in-command is his chief assistant engineer, and whereas the personal clerk will be keeping his superior in touch with what is going on in the

office, he will keep his chief in close touch with what is going on outside. This does not absolve the station engineer from going out and seeing for himself—in fact he must do so, as he can probably detect small changes or faults quicker than anyone, with his great experience and the very fact that he is not always on the works, and can immediately take what action is needed. No, the station engineer must be able to rely on his chief assistant to keep the works running, to see that raw materials are coming in as they should, and to be sure that products are being delivered as required and in the quantities asked for. This will allow the station engineer a certain amount of detachment from the hour-to-hour and day-to-day running of the works, so that he can attend meetings at a distance or take a holiday, knowing full well that someone competent is in charge.

The chief assistant engineer must in his turn be sure of his assistant engineers. They will be in charge of the running of individual parts of the works. An assistant in charge of carbonizing, another in charge of C.W.G. and other gasification plants, a third responsible for purification, the benzole plant and ammonia recovery, and others wherever the station engineer may think will be most advantageous. These assistant engineers will be responsible to the chief assistant engineer for their particular departments and it will be his concern to arrange for the rota of who is on night duty—the 'orderly officer'—and should anything happen while he is on duty the foreman will know exactly how and when to get in touch with him. It will be the duty of the assistant engineer either to put the matter right himself or call out the necessary specialists and, if need be, inform the chief assistant engineer. Mr. Webber is against the idea of shift engineers or superintendents. Other specialists, in Mr. Webber's view, such as electrical and mechanical engineers, should be used as little as possible and their employment should depend on the size of the works. If it is necessary to have them one man might do the job of both and he would rank as an assistant engineer, but they and the safety officers should, we think, be at group level, unless a works is considerably bigger than the 'big average' works would be, in fact about the same size as would be considered a reasonable responsibility for a group officer.

At first sight this would seem to be a costly organization, but Mr. Webber assures us that it is not. In the works he has in mind, which would have a manufacturing capacity between 10 mill. and 30 mill. cu.ft. per day, his system of management costs over a year as little as .118d. per therm, with foremen .218d.

So that the organization may work as smoothly as possible, Mr. Webber strongly recommends a well equipped telephone system throughout the works with a proper private branch exchange in the office or some form of automatic system but—and this is most important in Mr. Webber's opinion—a secondary nerve centre outside the office, in the exhauster house, for example, for use after office hours, so that communications may still be maintained if advice is needed. This would certainly be a time saver if someone was needed in a hurry and might even justify a 'paging' loudspeaker equipment.

WHAT have the world's great fortunes been built up from? Why, an idea, of course—skill, knowledge, and much hard work have been essential ingredients in the recipe of each success story, but without the idea to set the ball rolling there would have been no story. The Minister of Fuel and Power is evidently aware of the value of ideas: Any member of his Department with a bright one for increasing efficiency can pick up a cool ten shillings on popping it into the suggestion box, the House learned recently. And a really brilliant idea has been known to net as much as a couple of pounds!

Yet for all these tempting inducements only about eight suggestions are submitted over the year.

Perhaps the Minister might do well to seek a word of advice and guidance from his colleague in the Health Department who reaps an annual bumper harvest of 46 suggestions from his staff with book tokens as the inducement!

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Why, the Parliamentary Secretary was asked recently, was the East Anglian allowed less coal than his fellow citizen in the North? Didn't he know that East Anglia could be just as chilly in winter as the North of England? He knew only too well, it turned out: He lived there! But, he pointed out—and, of course, spoke from personal knowledge—it didn't *stay* chilly in East Anglia for weeks on end as it did in the North. And it was nothing like as wet.

Having thus made out a good case for preferential treatment for the Northerner, he told his next questioner that the price of coal in Scotland was determined on the same principles as in the rest of Great Britain. Had he forgotten, his questioner flashed back, that he had just said the North was wetter than the South?

In Parliament

Another Member then wanted to know the calorific value in thermal units for each of the seven grades of domestic coal, the average sulphur content of each, and ash residue on complete combustion. Mr. Renton could not supply the answers. He had asked the National Coal Board and they had not been able to tell him, it seemed.

But didn't he realize the important bearing of sulphur content on atmospheric pollution? he was asked. And how could the purchaser of the best grade of coal be sure that he was not being given the worst? And had the N.C.B. been rebuked for not being able to supply elementary information? It all seemed to add up to a lot of awkward questions that somehow failed to get anybody anywhere.

On the subject of atmospheric pollution the Minister of Health was asked some days later whether he would arrange for the acidity and sulphur content of the atmosphere in industrial areas to be regularly estimated so that warning of approaching danger could be given and precautions taken by those most susceptible.

Arrangements were already in force for warnings and advice to be broadcast when persistent fog was forecast in industrial areas, said the Parliamentary Secretary to the Ministry of Housing and Local Government, who said that he had been asked to reply. Regular measurements of sulphur dioxide in the atmosphere were made by some 180 local authorities and other bodies.

But if warnings had been more efficiently given and heeded could not a good many of the thousands who died from this cause have been saved from death? the questioner wanted to know. The warnings were given by the B.B.C., said Mr. Powell, firmly. *And their heeding was a matter for the general public.*

The inference would seem to be, we feel, that this reply throws something of a highlight on the need for a drive to educate the general public. Now that the cigarette has, to some extent at any rate, been found not guilty of sole responsibility for the increase in deaths from lung cancer, air pollution must come more and more under suspicion as the arch villain of the piece. But the public still appears unaware.

Personal Notes

MR. W. H. LLOYD, C.B.E., Local Manager, Westminster, North Thames Gas Board, and MR. BRYAN BEWSHER, Local Manager at Harrow, have retired. Both have over 44 years service in the industry. Mr. Lloyd served at the Westminster gas offices for more than 20 years, going there as Service Supervisor in 1935 after a period as assistant officer in charge of training at Watson House for the old Gas Light and Coke Company. He was promoted to Local Manager in 1946. The Board have appointed as Mr. Lloyd's successor, MR. T. W. BALL. Mr. Bewsher started as a telephone boy with the old Brentford Company, and was later transferred to the Chief Inspector's office. In 1924 Mr. Bewsher was put in charge of the Inspectors' office. After the amalgamation with the Gas Light and Coke Company, Mr. Bewsher was transferred to Pinner as Inspector-in-Charge followed by a similar post at Hounslow. Then followed a series of administrative posts until in 1943 he was appointed Local Manager at Harrow.

MR. A. T. SCALES, Sales Director for J. C. Neville Ltd., will be leaving early in May for the Middle East. During his journey he will visit officials of the Kuwait Government, the Kuwait Oil Co. Ltd., and other customers in Iraq using 'RG' tube cutting and screwing machines, for the purpose of extending after sales' service. The promotion of further sales for these machines and tube bending machines will also be included in his programme.

MR. G. M. GRACEWOOD retired from the service of Electrolux Ltd. on April 30 after being with the Company since 1928. He joined as a refrigerator salesman covering the Northampton, Nottingham and Leicester area. He was South London District Manager until January, 1955. From then onwards he has been on special duties at the Electrolux Head Office in Regent Street. His colleagues presented him with a binocular. He will spend his retirement at his farm just outside Twineham.

MR. G. R. SMITH has been appointed Training and Education Officer with the Karachi Gas Co., Ltd., being under contract to D. and C. and William Press, but loaned by the North Thames Gas Board for three years in the first instant.

MR. JOHN CHARLES BELCHER, of Windsor, is standing as a Labour candidate in the Castle Ward at the Windsor municipal elections on May 10. He is a gas fitter employed by the North Thames Gas Board.

MR. E. J. HULTON, Manager of the Northfield showrooms of the West Midlands Gas Board for the past ten years has been appointed to a similar position at Kings Heath. His successor at Northfield will be MR. L. J. BISHOP.

MR. R. F. BISHOP has been appointed Chief Engineer (Special Developments) of Whessoe Ltd., Darlington. MR. D. S. HUDSPETH is now Chief Engineer (Petroleum Equipment).

MR. H. M. LAWRENCE has been appointed Materials Handling, Transport and Coal Manager to the Southern Gas Board with effect from May 1.

MR. EDWARD C. LEJEUNE, an Assistant District Manager of the South Eastern Gas Board, has been nominated as President of the Society of Engineers.

Obituary

MR. TOM MEDCALF, who was for many years Chairman of the former Swindon United Gas Company, has died. Mr. Medcalf, who was aged 83, joined the board of the former Swindon United Gas Company in 1930, later succeeding Major Frederick Wright as Chairman. Mr. Medcalf remained Chairman until the nationalisation of the gas industry in 1949, and it was during his chairmanship that the gas companies at Marlborough, Wootton Bassett, Cirencester, Highworth, Hungerford and Cricklade were incorporated with the Swindon Company.

MR. W. J. RIGHTON, Chairman and Managing Director of Righton & Sons, Ltd., died on May 1. It is announced that no important changes are anticipated in the future policy of the Company.

HUDDERSFIELD PLANT WILL REDUCE SMOKE

During the summer work is to begin on equipping Huddersfield gasworks with a new £300,000 plant which will reduce production costs, help the town's smoke abatement scheme and improve working conditions.

One of the features of the improvement will be increased production of coke which is especially suitable for the domestic market.

The work will probably take two years to complete but there will be no interruption of gas production during the change-over.

SCOTTISH BOWLS

The Scottish Association of Gas Managers' Bowling Club played a match against the Scottish Gas Board at Dunfermline.

It was a keen match, the Dunfermline Club winning by 77 shots against 67 shots.

After the game tea was served in the clubhouse, when the President of the Dunfermline Social Club, Mr. Muir, expressed the hope that this would be an annual fixture. Mr. Rutherforth of Dalkeith replied on behalf of the Scottish Association of Gas Managers.

Diary

May 9-19. — MECHANICAL HANDLING EXHIBITION: Earls Court, London.

May 14-17.—PHYSICAL SOCIETY: 40th Annual Exhibition of Scientific Instruments and Apparatus, Royal Horticultural Society Hall, Westminster.

May 16 to 18.—INCORPORATED PLANT ENGINEERS: Ninth Annual Conference, Hotel Majestic, Harrogate.

May 17.—YORKSHIRE JUNIORS: Joint meeting with Manchester Juniors. Visit to Oughtibridge Silica Firebrick Co. Ltd., Oughtibridge, near Sheffield, 10.30. 'The Character of Silica Products and their Effect on Durability in the Carbonizing Industry,' T. R. Lynam.

May 19.—WESTERN JUNIORS: Visit to South Western Tar Distilleries. Paper, 'The New Gas Works under Construction at Truro,' I. F. Carr. Plymouth.

May 25.—LONDON AND COUNTIES COKE SALES CIRCLE: Annual General Meeting, Connaught Rooms, Great Queen Street, W.C.2. 2.15 p.m.

May 25. — LONDON AND SOUTHERN JUNIORS: Annual Business Meeting. Meyerstein Theatre, Westminster Hospital School of Medicine, Horseferry Road, London, S.W.1. 6.30 p.m.

May 26.—SCOTTISH JUNIORS (EASTERN): Annual General Meeting, Training College, Edinburgh. Postponed from May 12.

May 29-June 1.—INSTITUTION OF GAS ENGINEERS: 93rd Annual General Meeting, Royal Festival Hall, London.

May 30.—SOCIETY OF CHEMICAL INDUSTRY, CHEMICAL ENGINEERING GROUP: Annual General Meeting and Dinner, Café Royal, Regent Street, W.1. 6.15 p.m.

June 2.—SCOTTISH JUNIORS (EASTERN DISTRICT): Annual Outing to Perth.

June 4.—WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham 3. 2.30 p.m.

June 5.—SOUTH EASTERN G.C.C.: Caxton Hall, London. 11 a.m.

June 7.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11.0 a.m.

June 8.—SCOTTISH JUNIORS (WESTERN): Golf Outing.

June 14.—INCORPORATED PLANT ENGINEERS: Brains Trust, 'Fuel and the Future,' The Royal Institution, Colquitt Street, Liverpool, 7.15 p.m.

June 14.—MIDLAND JUNIORS: Ladies' Day. Visit to Derbyshire Silica Firebrick Co. Ltd., Friden.

June 14 and 15.—EASTERN SECTION, I.G.E.: Annual General Meeting. Chairman's Address. Paper, 'Gas in the Rural Areas,' J. T. Brookes, Great Yarmouth.

MEMORABLE EASTERN JUNIORS' MEETING

THE annual general meeting of the Eastern Junior Gas Association at Lowestoft on May 5 was memorable, not only for the large attendance in beautiful weather, but for the number of honoured guests who took part in the proceedings. These included Sir Henry and Lady Jones, Mr. and Mrs. W. K. Hutchison, Sir John and Lady Stephenson, Mr. and Mrs. J. H. Dyde, Mr. R. H. Epps (the guest speaker), Mr. Rupert Weston (Divisional General Manager, Norwich), Mr. J. H. Greenacre, Chairman of the Eastern Section of the Institution, and Mr. and Mrs. Bernard Clarke (Lincoln). The meeting was held at the Royal Hotel under the presidency of Mr. F. G. Cox, of Norwich.

Opening the proceedings, the President referred to the regretted absence of Mr. Sydney Smith, Mr. E. H. Harman, and of their own Honorary Life Member, Mr. J. Hunter-Rioch.

In his annual report for 1955-56 Mr. Cox claimed that it had been another happy and successful year in their history. There had been an increase in membership of 20, bringing the total strength up to 177 members and associate members. In planning the programme care had been taken to see that each member had at least one meeting reasonably accessible to his home town. The attendance at the September meeting in Norwich was a record of 147.

He made special reference also to the visit to Watson House, emphasizing, however, that he would like to find more members prepared to give papers, assuring them that short papers or joint papers were always acceptable.

The President concluded with a special reference to Mr. A. R. Warren, of the Lincoln Undertaking, East Midlands Gas Board, recently invested with the B.E.M.

Election of Officers

For the 1956-57 session MR. E. S. DENNIS, Colchester, was elected President; MR. J. L. IRELAND, Lincoln, Vice-President; and MR. W. F. PRITCHARD, Tottenham, Junior Vice-President. MR. HOSKIN and MR. KINSLEY will be joining MR. HILHAM and MR. WINCH on the Eastern District Gas Education Committee.

Mr. Dennis, thanking the members for his election, at the same time expressed, on their behalf, appreciation of what Mr. Cox had done for them during the past year. He would be taking away many happy memories of his presidency; for their part they had all enjoyed working under him, and his leadership had meant much.

Mr. Ireland supported the vote of thanks: The increase in membership alone showed appreciation of the Past-President's organizing power.

Mr. H. E. Wilks (Honorary Secretary and Treasurer) proposed the traditional vote of thanks to the Eastern and East Midlands Gas Boards. In acknowledgment, Mr. Dyde said that the strength of such associations depended upon the work of individual members. Their programme had been submitted to the Boards—a courtesy which they appreciated—and he was able to assure them that if they continued on such lines they would certainly have the continuing support of the Boards.

Lady Somerleyton (seen here with Mr. R. H. Epps) personally greeted the President and the other visitors to the Hall.

S.B.G.I. Award

It was announced that the 'S.B.G.I.' Award had been granted to Mr. G. Hall for his paper on 'Steam Utilization in Gas Works,' presented in January, 1955.

Mr. R. H. Epps, Secretary of the Eastern Gas Board, then presented his address on the Eastern Gas Board's area of supply, abstracts from which appear on p. 495.

Luncheon

At the ensuing luncheon the toast of the Association was proposed by Mr. W. K. Hutchison, who had hastened from the Wales and Monmouthshire meeting in North Wales for the occasion. Mr. Cox in reply thanked the President for his support, noting the many calls on his time and the many such functions which he attended.

Mr. Dennis proposed the Eastern Gas Board, to which Sir John Stephenson replied, confessing that this was the first time for years that he had missed the Cup Final. He had often wondered why they were called Juniors, for it appeared to him that the papers presented at the Association meetings were second to none. In any case his support and interest could be taken as assured.

Referring to the optimism of Sir Harold Smith, Sir John said the gas industry had had several stages of failure, preceding on each occasion a stage of great progress. He thought the industry was now at the point of another big move forward.

The toast of the gas industry was proposed by Mr. Weston and replied to by Sir Henry Jones. Sir Henry said that the gas industry was dependent on the population buying their goods, and so on the services they rendered. In the last financial year the industry's revenue was £325 mill. It could not stand still, and the new processes cutting into gas manufacture offered the greatest hopes. On the other hand he reminded them that though our coal prices were the cheapest in Western Europe, in their area gas could be made cheaper by oil. The industry should not take too seriously the increase in coal prices.

The Juniors then went off to visit the historic mansion and park of Somerleyton Hall, returning later for tea at the Royal Hotel.

Parkinson & Cowan Limited

MR. H. P. BARKER'S REVIEW

THE fifty-sixth Annual General Meeting of Parkinson & Cowan Limited was held on May 9 in London.

Mr. H. P. Barker, in the course of his Review, said:

You will already know that Sir George Jessel vacated the Chair of your Company on December 31 last after holding that office for eight eventful years. Your Board did me the honour of electing me to succeed him.

The Directors' report shows that owing primarily to Government measures to restrict the home sales of domestic appliances, we suffered in 1955 a severe—though it will prove, I think, transitory—setback in our affairs.

Having in mind, however, the improvement in the Group's trading which has taken place since the beginning of the year, your Board recommends the payment of an Ordinary dividend at the rate of 5% for 1955. If 1956 continues as it has begun we should enjoy much better fortune than in 1955, and your Company should resume its upward progress.

The Report and Accounts were adopted.

The retiring Director, Mr. R. J. Rogers, was re-elected, as were also Sir Geoffrey Vickers, V.C., and Mr. G. Jessup Cutbush.

The Chairman concluded with a tribute to staff and workpeople.

AYR'S HOLDER INFLATED

Will Keep Pace With Demand

AYR'S new gasholder at Weir Road has now been completed and was recently inflated with air for testing purposes, preparatory to its going into use.

The gasholder has taken about three years to construct, at a cost of about £155,000, and will be able to store 3 mill. cu.ft. of gas, compared with the 450,000 cu.ft. capacity of the main gasholder of the Newton gasworks. It has a diameter of 185 ft., and when fully inflated has a height of 167 ft. It comprises four sections.

Improved Supply

The gasholder will give Ayr an improved supply and will minimize the possibility of future breakdowns. It is the first time since 1905 that additional gas storage accommodation has been provided in Ayr, despite the fact that the demand has increased by more than six times since then.

Although the gas system in Ayr consists of two distinct piping networks in the northern and southern parts of the town—a legacy of the pre-nationalisation years when there were two companies—the new gasholder will ultimately supply the whole of Ayr.

This was made possible in 1951, when the systems were linked by a pipe across the New Bridge, and while repairs were carried out at the Ayr works last summer, Newton gasworks came to the rescue.

The present gasholders at Damside and Cromwell Road are, however, to be retained for 'stand-by' purposes. For the time being the new holder will take over the supply for the Newton area now served by the gasholder at the Newton gasworks, which is to be kept in partial use.

For a long time the need for more storage accommodation has been felt acutely in Ayr and the new gasholder will enable the service to keep pace with demand at all times. Eventually Ayr's gas service will be distributed mainly from Newton-on-Ayr but Mr. C. E. N. Freshney, District Manager, states that despite this centralization policy there is no question of the Ayr gasworks being scrapped in the foreseeable future.

Life begins at Forty-Five

Three Years' Study Pays Dividends

AT the age of 45, Mr. John F. Benson, Assistant in the North Western Gas Board's Solicitor's department, has passed the Law Society's final examination held in March. Only 173 candidates passed out of 337.

Mr. Benson, who became articled to the Board's Solicitor, Mr. Colin W. Smettem, only three years ago when he was 42, passed the Law Society's preliminary examination the same year and the Law portion of the intermediate examination and Trust accounts and bookkeeping examination the following year.

Mr. Benson who is married and has one child lives in Blackpool.

SMOKELESS ZONE FOR SURVEY

NEWCASTLE-ON-TYNE City Health Committee is to commence work shortly surveying the first area in the city to be defined as a smokeless area.

This will comprise the business centre of the town and premises involved include the Town Hall and the Central Railway Station.

The Health Committee has included £2,250 in its estimates to cover the cost of the survey, expected to take six months.

THE HOUSECRAFT CONFERENCE

This Way— Miss Sauumdranayhgam

FORTY women teachers of housecraft attended a conference held by the North Thames Gas Board at the Queen Elizabeth College, Kensington, London, in April. Here a home service adviser is demonstrating a cooker to Miss Sauumdranayhgam, from the Ceylon Training College. Mr. F. W. Dunning and Mr. C. H. Purkis both gave lectures. (See last week's Editorial Comment.)

'A Great Day for the Irish'

Irish Association's A.G.M. at Portrush

WITH the elements supplying a characteristically rapid alternation between sunshine and showers, the Irish Gas Association met at Portrush, County Antrim, last week for their annual general meeting. It may be said that while sunshine cheered the hearts of all, and the golfers in particular, the rain in no way dampened the pleasure of the company who were gathered together to honour the presidency of Mr. J. Lusted, Engineer and Manager of the Strabane Urban District Council Gas Department. Adding much to the success of the meeting was the presence of Mr. W. K. Hutchison, President of the Institution of Gas Engineers, who was in good spirits and fine voice, and Dr. W. T. K. Braunholtz, Secretary of the Institution. The meeting took place within the welcoming walls of the Northern Counties Hotel.

A welcome to Portrush was extended by Mr. W. R. Knox, O.B.E., Chairman of the Portrush Urban District Council, and then Mr. N. J. Robertson, Director-General of the Association, spoke of their pleasure in having Mr. Lusted as their President. He was a long-standing member both of the industry and of the Association, and by virtue of his special skills was in every way worthy of the dignity of the office to which he had been elected. He was sorry that the difficulties which beset the industry in Ireland had tended to increase, but he knew that their President was no subscriber to pessimism.

The President's Address

In his presidential address Mr. Lusted said that the past year had brought no easing of the difficulties of which the industry had had its full share since the end of the war, and the apprehensions and pressures of which past Presidents had spoken and which were attributable in general to the continuous growth of monetary inflation and uncertainty, shortage and high costs of coal supplies. These factors were clearly the cause of present difficulties. Production costs of coal had continued to rise, and the burden transferred to the gas industry and to other coal consumers. The position had given further reason for concern in the frequency with which these increases had occurred, and the absence of any indication that a ceiling to the advances was in sight.

Prices payable by undertakings in Southern Ireland, which came under the Coal Board's export schedules, had in the past year risen even more steeply than home prices, and these undertakings must meet a further addition of 27s. per ton as from the end of this month. The total price rise was equivalent to the enormous figure of 42s. per ton over one year. Increased costs must be recouped and these imposts, together with higher shipping and transport costs, had so far been only partially reflected in higher prices of products. No undertaking, either north or south, could view the position and developing prospects with anything but apprehension, and in the case of the smaller works the situation was now so serious that the futures of many were seriously prejudiced.

Every effort to lessen the extent of increased costs and coal prices had been made, and they were informed by their Southern colleagues that the National Coal Board, whose difficult task must not be under-estimated, had met their urgent representations with courtesy and sympathy. Nevertheless, the burden of these new coal prices remained alarming and constituted a threat to their existence. It posed the question as to whether and by what means relief could be secured to maintain their competitive position. There was no ready or satisfactory solution to hand, and it seemed inevitable that assistance from the Governments, both Northern and Southern, must be sought if a remedy was to be found. The claim that the industry was vital to the community was soundly based. The employment given was substantial and contributed to prevent the drift of populations from the rural townships and small provincial communities.

The severe shortage of coal throughout Europe demanded its maximum thermal efficiency of use and imposed a natural duty on those in authority to ensure that wasteful utilization was not permitted. Coal carbonized in modern gas plants and sold as gas and coke enabled higher efficiencies of conversion and utilization to be obtained than by any other commercially practicable method. The burden of high and mounting costs of fuel imports on national economies demanded from financial considerations also that the highest efficiency and, therefore, the greatest fuel economy, be sought.

It might be said with confidence that the claims of the industry were sound and to place them before their Governments for recognition by way of financial assistance was not a revolutionary or unreasonable proposition. Their Legislators in Northern Ireland had, by means of loans and subsidies, stimulated agriculture, linen, fisheries, transport, electricity and many other industries, and in his view the time had come when both sections of the Irish industry should each consider a collective approach to their respective Governments. Their proposals must be well considered and objectively constructive, seeking not only assistance to meet what could be regarded as present transitional difficulties, but also to outline plans for the re-equipment and modernization of the industry to secure the benefits of advancing techniques of both manufacture and supply. It must be their plan not only to operate at higher efficiencies and lower prices, but also to integrate their objectives with the official policy of assisting decentralization of industry and of maintaining employment in the smaller urban centres.

Turning to their experiences with labour, it was gratifying to observe that the year just past had been one during which the almost unique dispute-free record of the gas industry in Northern Ireland had been maintained. During this decade of rising costs it had not always been easy to find mutually acceptable solutions to employees' claims, and their financial prospects were not calculated to assist in finding solutions any more easily to the inevitable future demands for higher wages and improved working conditions. They were fortunate, however, in possessing in this industry a relationship between employers and employees which was second to none, and he was confident that the value of this goodwill and the benefit of ordered relations was understood and sought by both sides, and would continue to their advantage. New techniques and methods to cheapen the cost of gas-making, always in

The Northern Counties Hotel, Portrush, venue of the meeting.

their minds, had today special significance and, from technical reading and discussion, it was clear that advances were being made which in due course would bring the industry great benefits.

Summing up the experiences of the past year, the President described them as of not unsatisfactory achievement and progress secured by conscientious and strenuous effort. The official measures of financial stringency had so far affected them considerably less than most industries selling consumer goods, which had been brought about no less by their consumers' appreciation of their high service than by the essential nature of their business.

There is no telling what may turn up in an editorial notebook. These discovered doodles show, left to right, Mr. J. W. Young, Mr. J. Lusted, and Mr. N. J. Robertson.

As to the future, rises in costs generally, but particularly of coal and its transport, were more adverse to them than certain competitive fuels and together with associated difficulties of finance allowed for no easy optimism. As an industry composed mainly of small units, they faced a future in which sustained effort and flexible thinking were required, and in which the quality of resourceful management would be a decisive factor. This assessment, however, though it was factual, was made in no spirit of despondency and, as one of the older men in the industry, he could recall in the past periods which had contained a no less serious challenge and threat of being outmoded, and yet today the Irish gas industry sent out more gas, sold more appliances, and served more consumers than it had ever done before. For his part he was convinced that provided they used their opportunities wisely, they would surmount their difficulties and carry the gas industry in Ireland to even higher levels of achievement.

Later Mr. J. W. Young, Engineer and Manager of the Lurgan Borough Council Gas Department, presented 'Some Observations on the Smaller Works Practice in Ireland.' (This will be published, together with a report of the discussion, in next week's issue.)

New Officers

The following officers were elected to serve for the coming year: *President*, Mr. J. K. Cantwell (Wexford); *Senior Vice-President*, Mr. T. Dougall (Londonderry). The Northern Committee will consist of Messrs. T. P. Scott, T. F. Hastings, J. W. Young, and A. Robin; and the Southern Committee of Messrs. S. L. Doyle, F. K. Thomas, J. Kneeshaw, and J. O'Regan. Mr. N. J. Robertson (Alliance and Dublin Consumers' Gas Company) will continue to be Acting Director-General.

During the afternoon members and their ladies enjoyed a visit to the Giants' Causeway and then gathered in the evening for the Association's Annual Dinner.

The Annual Dinner

After the President had proposed the toasts 'The Queen' and 'Ireland,' the principal guest, Lord Glentoran, H.M.L., M.P., the Minister for Commerce for Northern Ireland, proposed the toast of 'The Irish Gas Industry' and 'The Irish Gas Association.'

Welcoming the visitors from Eire, he said that it was the policy of the Northern Ireland Government to have friendly relations with its neighbours, particularly in the economic sense. The Irish Gas Association was an example of the benefit derived from co-operation between the two countries.

Replying, Mr. N. J. Robertson described the Irish gas industry as 'a mixed lot,' but one which was doing a good job and assisting the national economy by giving widespread employment.

Proposing the toast of 'Our Guests' and 'Kindred Associations,' Mr. F. K. Thomas, Engineer and Manager, Limerick Corporation Gas Department, made particular reference to the presence of Mr. Hutchison and Dr. Braunholtz. 'You must remember,' he said, 'that the President only lasts for 12 months, but Dr. Braunholtz *is* the Institution.'

Mr. Hutchison, replying, expressed his pleasure at attending the meeting and, speaking of the function of the Institution, mentioned their part in furthering technical investigations for the ultimate good of the industry. They were all passing through a difficult time, but they were in possession of a fuel which was quick and clean and would stand up to competition, which was excessively severe at the present time, particularly in Ireland.

Visitors from England—Mr. W. K. Hutchison and Dr. W. T. K. Braunholtz.

Other toasts of the evening included that of 'The Strabane U.D.C. Gas Undertaking' and 'The Portrush Urban District Council' proposed by Mr. J. L. Hyslop (Belfast Corporation Gas Department), to which replies were given by Mr. J. Bradley, Assistant Town Clerk, Strabane Urban District Council, and Mr. W. R. Knox, M.M., O.B.E., Chairman of the Portrush Urban District Council; and 'The Press' and 'The Ladies' which was proposed by Mr. J. S. Clegg and to which Mr. G. W. Battison, Editor of the 'GAS JOURNAL,' responded.

In the golf tournament on the following day Mr. N. J. Robertson retained the Gas Industry Cup and Mr. M. A. Waddell (Carrickfergus Gas Company) was the runner-up with the best gross.

GREATER DEMANDS FOR TRAINING

—*Mr. Hutchison at London Section Lunch*

THE demands for training and education in the gas industry are greater today than ever before, said Mr. W. K. Hutchison, President of the Institution of Gas Engineers, at the London and Southern Section annual luncheon preceding the Spring meeting on May 7.

This was accounted for by the problems in large scale organization and integration, the need to fit people for promotion and to maintain succession to all levels in the organization, the increasing complexity of processes, plant and appliances, and the pressure of competition.

After reviewing current and proposed 'sandwich courses' held by the gas industry, Mr. Hutchison said: 'It is obvious that the gas industry can support only a limited number of sandwich courses in gas engineering throughout the country. Considerations of geography are not so important because it is desirable that the technical college course should be residential.'

He was proposing the toast of 'the Section,' and the Chairman, Mr. J. M. Webber, replied.

The toast of 'The Guests' was proposed by Mr. G. Dougill, Senior Vice-Chairman, and Mr. F. M. Birks, C.B.E., acknowledged.

At the meeting in the afternoon, Mr. Webber delivered his Chairman's Address, an appreciation of which appears in Editorial Comment.

At the meeting's opening the Chairman extended a hearty welcome to the President of the Institution, to Mr. F. M. Birks (lately Deputy Chairman of the North Thames Gas Board), and to Mr. E. J. C. Dixon, Ministry of Fuel and Power.

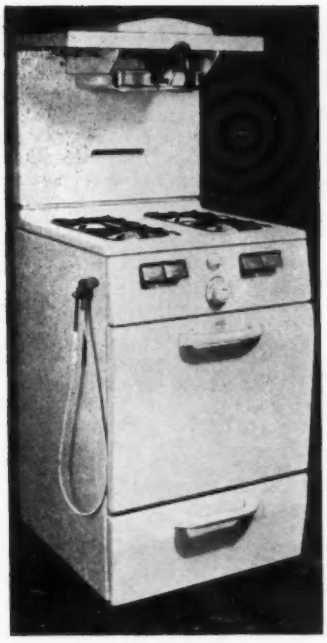
Offiers elected for the ensuing session were: Chairman, G. DOUGILL; Senior Vice-Chairman, C. STOTT; Junior Vice-Chairman, J. C. HOGG.

Mr. Dougall made suitable acknowledgment.

At the conclusion of Mr. Webber's address, Mr. Hutchison congratulated him on successfully carrying out a difficult task. It was a clever and thought-provoking presentation. He would mention that the South Eastern Gas Board, in taking over many undertakings on vesting day, had particular pleasure in the Chairman's works at that time which evidenced skill, low cost and negligible manpower.

WHAT'S The Modern Housewife Using These Days For COOKING?

New Appliances Reviewed



The Renown Six.

PURSUING our practice of giving the gas engineer a periodic glimpse at the activities of the appliance manufacturer, we devote the next four pages this week to a review of the latest developments available to the consumer. Cookers, water heaters, washing machines, and industrial heaters make up the list. We start with cookers.

Illustrated at the foot of the page is the New World 3528 range, a straightforward development of its immediate predecessor, the 3518, but with several new or improved features. For example, Radiation Group Sales Ltd., have so designed it that all boiling burners and the griddle plate burner light automatically as soon as the taps are turned full on. There are two pilot flames controlled from a single pilot tap located below the cooking top at the front. Any hotplate burner can be turned on immediately merely by turning the tap full on. The ignition system is based on the flash tube principle with a lighting jet on each burner.

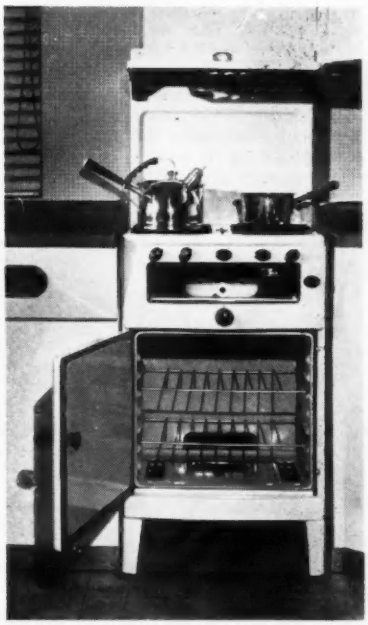
The oven door is now held closed entirely by spring action, with no mechanical latch. Improvements in appearance include redesign of the central feature in the splashback, polished boiling burner heads, and the application of light alloy fairings around the oven, grill and warmer doors providing complete closure of the small gaps between inner and outer panels seen when the doors are open. A refinement is that should a burner be lighted with a match, the lighting jet on the burner automatically lights as well.

Of elegant and contemporary design, the Parkinson Stove Co., Ltd., 'Renown Six' is the lowest priced cooker with an eye-level grill yet produced. A feature of its design is that it is easy to clean. Easily removed hotplate, interchangeable spillage trays, hotplate burners and pan supports, together with rounded corners in the oven, contribute to this.

The large single-burner oven, which has a drop door, is raised above the conventional height and a desirable feature is that the shelves cannot be pulled right out by accident. On the Ajusto oven heat control is a special mark which introduces the use of a 'simmering oven.'

All the hotplate burners are self-lighting but a torch is attached to the lighter elbow for lighting the grill and oven. The tap handles are designed so that precise control of the burners for simmering is possible. These handles, which are fitted flush with the front of the cooker, are available in cream, red, green, or blue and are clearly marked for identification with the burners. The cooker, which is finished in cream vitreous enamel, is designed to fit flush against the wall with a forward-vented oven flue. There is a spacious storage compartment beneath the oven to provide room for cooking accessories.

New World 3528 range.



Flavel 'Mercury.'

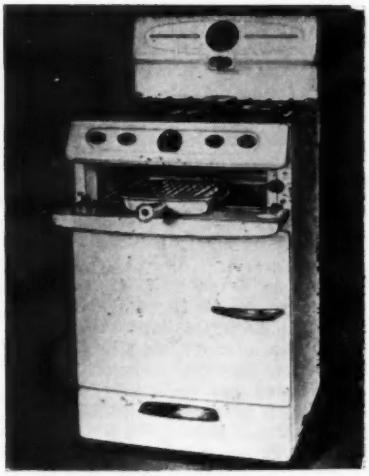
Fresh from the Flavel stable is the new 'Mercury,' a handsome appliance in the popular price range. It is finished in white, ivory or fawn, and with push-turn safety plastic taps and controls in a choice of ivory, red, blue, bergundy, brown or black at no extra cost. The hotplate consists of twin pan supports giving increased stability, and the tap assembly and thermostat control are mounted to present a pleasing appearance and ease of operation. The capacious grill has a matching grill plate and pan, while the oven interior is finished in light reflecting 'ice-blue.' The bow-front design gives a larger than usual capacity.

Sidney Flavel and Co., Ltd., have also raised the curtain on the 'Envoy,' which incorporates many practical new features. Finished in high quality vitreous enamel in either ivory or white, the 'Envoy' boasts push-turn safety plastic taps and controls in a choice of ivory, red, blue, burgundy, brown or black at no extra cost. The hotplate is of entirely new design ensuring 'glide-over' pan stability, and the burners are of the latest aluminium die-cast head type with complete 'lighting-round characteristics' controlled at 'high,' 'low' and 'off'; in-between settings may be selected by the consumer.

The grill compartment is finished in the new 'ice-blue' vitreous enamel with matching grill pan and extra large grill. The grill door has been specially styled to provide a working surface in the down position. The oven is of extra large bow-front design with 'ice-blue' finish and is heated by a back burner lit through a flash tube on the oven base.

For the first time, the oven can be used for either *baking* or *warming* by means of a patented control exclusive to Flavels. In the 'warm' position, food may be kept hot without drying up. The oven door can be fully closed with a gentle push. The 'stay cool' plasti-chrome oven handle with press-button release is also exclusive to Flavels.

The pull-out storage drawer, which can be withdrawn for cleaning, rides silently on roller bearings, and the ultra modern short splashback has a built-in four-hour timer, although a tall splash and double plate-rack is available if required.



Flavel 'Envoy.'

Of special interest to those housewives who do not wish to stoop for one reason or another, the New World 71 TT has the oven, fully enclosed in vitreous-enamelled panels, placed side by side with the hotplate and plate-rack, both units being firmly attached to a vitreous-enamelled plinth.

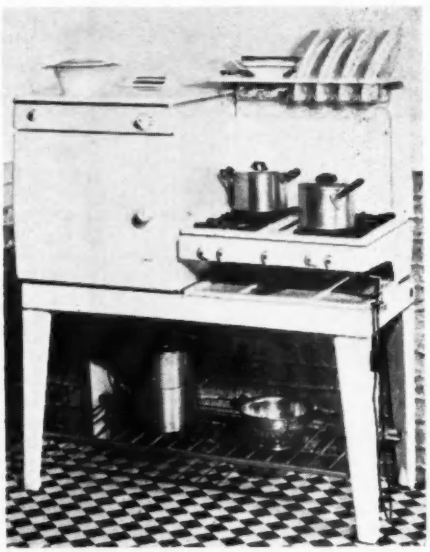
The oven, with Regulo control and heat-resisting spring door seal, is of the standard New World form and capacity found suitable for all normal family needs.

The burner and burner box can easily be lifted out together for cleaning. A small refinement is that the gas match elbow can be locked at the most convenient angle to avoid interference with adjacent kitchen furniture.

Points of technical interest include built-in governor to ensure steady gas pressure, safety taps, fixed-orifice injectors, and levelling screws with ample bearing surface in all four legs.

Cannon A130 cooker.

A new cooker for the flat or bungalow has been produced by Stoves, Ltd. Moderately priced, the New-home 'Kitchenette' No. 150 (pictured below) is compact in size and design for the small kitchen. A particularly pleasing feature is the design of the hotplate bars which are semi-circular in shape with good pan stability. The hotplate has two high-speed boiling burners and grill. The oven is thermostatically controlled and the cooker is mounted on legs with a convenient shelf beneath for pans. A forward flue vent in the splash-back, which is complete with plate rack, enables the cooker to be fitted flush to the wall. Other features include safety taps, perfect oven heating with two side burners, and easy-to-clean 'Superl' all-cream vitreous enamel.



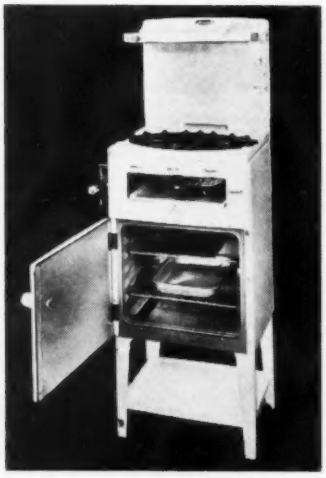
New World 71 TT cooker.

With a modern styling the new Cannon A130 cooker retains all the outstanding features of the earlier A125 model.

The hotplate, redesigned to provide greater efficiency and pan stability, is now floodlit by a tubular light built into the splashplate. Also built into the splashplate is a five-hour cook timer, while for easier lighting of the oven and grill, a hand lighter is fitted to the side of the cooker.

An important addition to the equipment supplied is the exclusive Cannon Roto-Roast, a rotary spit that clips onto the oven meat tin to provide perfect roasting conditions for the small joint or bird.

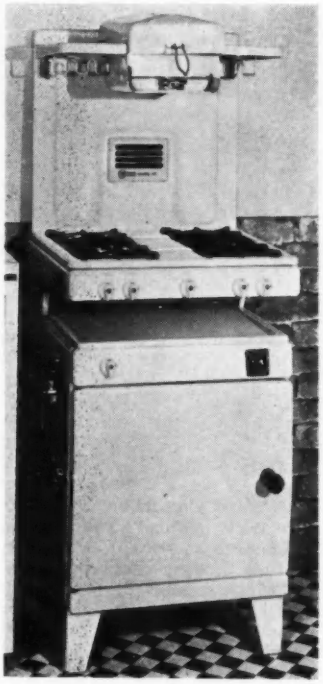
This cooker is available either with an integral grill over the hotplate or with splashplate only, and a separate grill unit which can be fitted over any kitchen cabinet or table alongside the cooker.



Two further additions to the Radiation Group Sales, Ltd., range are the New World 76 and 85 cookers with the advantages of eye-level grill. Lower running costs are claimed against the old models with the grill in the conventional position.

The arrangement of the eye-level grill is simple. The main structure of back-plate, plate-rack, and grill is rigidly assembled, and the few working parts are easily lifted out for cleaning.

The grill compartment, a vitreous enamelled sheet steel box, slips into place in the middle of the plate-rack framework, while the grill burner is fed from the back through the back-plate. It is finished in vitreous enamel and the usual cross-lighting arrangement is provided so that the whole burner lights even if the lighting flame is put to one corner only. The two grill frets are of heat-resisting sheet steel throughout.



New World 76 cooker.

A double inner grill cover fits above the grill. It has two layers, one of light alloy and the other of black vitreous enamelled sheet steel with a cooling air gap in between. The outer grill cover, sheet steel finished in vitreous enamel to match the rest of the cooker, fits over the inner grill cover, making a neat smooth finish to the assembly.

Products of combustion and food vapours escape through slots in the grill cover, and to avoid overheating or discoloration of decorations it is important to have at least 15 in. clear space vertically above the top of the outer grill cover.

The eye-level grill has a simple on/off tap placed within easy reach in the normal position at the middle of the control panel.

The grill pan is of the usual form, a sheet steel pressing, vitreous enamelled all over. The handle is designed specially for this application.

New World 85 cooker.

HOT WATER DEPARTMENT

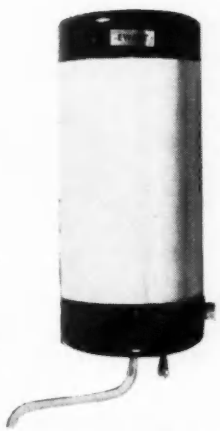
PROVIDING boiling water or instant hot or warm water, a new Ascot, the 509 boiling water heater, is now available to the housewife. All working parts of the 509, an improved and streamlined version of Ascot's famous RS 52/1 boiling water heater, are totally enclosed in a new-style streamlined shell in white or cream vitreous enamel, with chrome-plated top and bottom pans. A gas governor, ensuring fully efficient operation at all normal gas pressures, is an integral part of the heater.

Like the RS 52/1, the new 509 is fitted with a water governor and three-position temperature selector giving hot or warm water instantly and boiling water in less than a minute under all normal gas and water pressures.

In operation the 509 provides per therm of gas: 40 gal. of boiling water for tea or coffee making, at two to two-and-a-half pints a minute; 80 gal. for washing greasy dishes, etc., at half a gallon a minute; or 120 gal. for toilet and general household purposes, at three-quarters of a gallon a minute. Its output is 520 B.Th.U. a minute, input being 625 B.Th.U. a minute. Overall dimensions are: height 2 ft. 4½ in., width 7½ in., and depth 7½ in. without taps, 8½ in. with taps.

Pilot gas rate is ½ cu.ft. per minute. As the heater does not incorporate main gas or pilot cocks, a gas control cock must be fitted close to the inlet. As an alternative, a special Ascot control cock can be fitted immediately behind the heater.

The Ascot 509 heater provides warm, hot, or boiling water.



Ewart storage sink water heater.

An inlet working pressure of 7 lb. per sq. in. is required to give a flow of 0.6 gal. per minute.

Designed as a dollar earner, another addition to this company's range is the Ascot central heating unit, hot water boiler, Type 724, intended for the North American market.

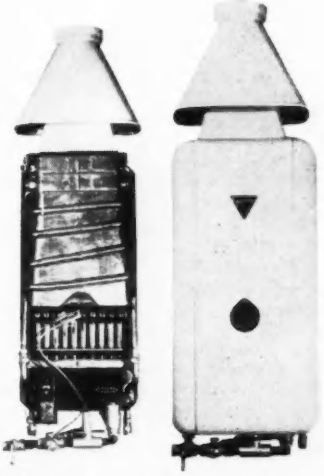
The unit is gas-fired and fully automatic, employing forced circulation, and is particularly suitable for use with panel or baseboard radiator systems. It will provide heat for the average small home with a floor area of approximately 1,200 to 1,400 sq. ft. It is hung on the wall and flued as the conventional Ascot multipoint.

It is approved by the American Gas Association for operation on the following gases: L.P., natural, L.P. gas-air mixtures, and manufactured. Specification is as follows: Rating, 84,000 B.Th.U. per hour input; weight, 65 lb. approximately; height, 43¾ in.; width, 14½ in.; depth, 14½ in.

COMPLETING the range of Ewart water heaters, the new Ewart S.18 provides up to 1¼ gallons of hot water at a time, to a thermostatically controlled overall temperature of 140°F. When its full 1¼ gallons capacity is drawn off all at once, the S.18 will have the same amount of hot water ready again in approximately 8 minutes.

Main characteristics are: Input, 9,000 B.Th.U. per hour; output, 1¼ gal. raised to 140°F. in 10 to 12 minutes; height, 20 in.; width, 7½ in. Stand-by gas rate is approximately 1 cu.ft. per hour.

Components include: Cut off valve actuated by bi-metallic strip heated by pilot by-pass flame; Jeavons J.10.R gas pressure governor and non-adjustable ball type thermostatic valve actuated by bi-metallic strip which operates by conduction of heat from the water. The bi-metallic strip is located at the bottom of the water container close to the water inlet for quick action when hot water is drawn.



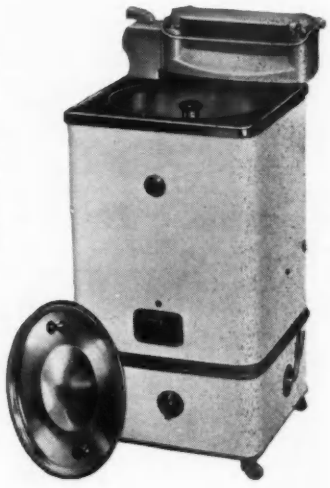
Dollar earning Ascot central heating unit shown with and without the outer case in position.

Helping Out on Wash Day

A NEW, low priced appliance to lighten the burden of wash day, is the Morley '55 Plus' gas boiler with built-on wringer, and separate clothes rest (Pictured on left.)

Available as an optional extra at little additional cost, the Morley Washer Unit is designed to fit into the lid of the boiler, converting it quickly and easily into a complete home laundering unit. Rrather surprisingly, in view of its compact and neat appearance, the boiler holds a full ten gallons of water.

A completely automatic washing machine is the new 'Ega' (pictured on right), manufactured by the Economic Gas Boiler Co., Ltd. It is fitted with a power agitator and wringer, which dispense with the final effort of hand-wringing. Gas heats the water in the pan to any temperature, thus allowing clothes to be boiled. A turn of the switch and the automatic agitator washes the clothes in 3-5 minutes. It will take up to 5 lb. of clothes and boil in approximately 45 minutes. An automatic power pump will fill or empty the contents in quick time.



New Industrial Heaters

THE problems of industrial and institutional heating have been the subject of considerable research and development by the Westminster firm of gas appliance manufacturers, William Sugg and Co., Ltd. Outstanding in the range of industrial heaters manufactured by this Company are two designed specially to heat various types of premises, and also to be so installed as not to occupy valuable floor space.

The first of these (see illustration) the 'Raymaster' overhead radiant heater, is suspended from the roof, and the other, the 'Halcyon' assisted convection heater, may be fitted on the wall, or behind the wall with special ducting to the area to be heated.

The 'Raymaster' is particularly suitable for lofty buildings as it is designed to direct the maximum amount of radiant heat downwards over a wide area. The normal fixing height is 9-10 ft. from floor. It requires no flue and no structural alterations to the building are necessary for its installation. It is silent in operation, requires very little maintenance and is extremely economical to run, the gas consumption being 30-40 cu.ft. per hour, according to requirements.

The 'Halcyon' is a convector heater in which the movement of air through the heating surfaces is assisted by a silent electric fan. The fan causes rapid circulation and provides an even distribution of warm air throughout the room. It is normally fitted on the wall, approximately 6 ft. from floor, and may be installed either in the room to be heated or fitted with standard duct components and sited in an adjoining room.

Manufactured by the Attewell Engineering Co., Ltd., of Devonshire Buildings, Wellsway, Bath, the new 'Wellsway' heater consists essentially of a gas-fired heat exchanger. Seven No. 4 industrial jets fire into a flat steel box coated with acid-resisting vitreous enamel. The products of combustion pass up this box and across into a second box mounted vertically behind the first. From this second box the flue leads off, usually upwards to an ordinary terminal.

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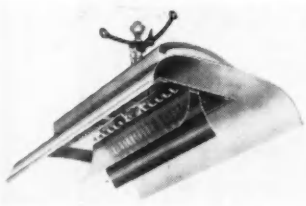

The 'Raymaster'

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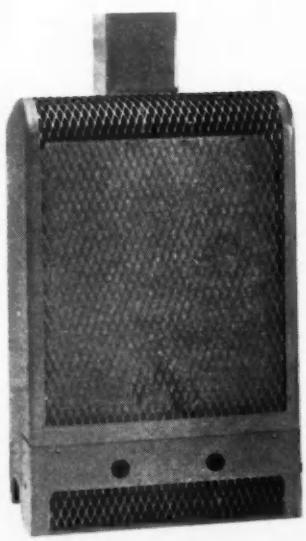

Wellsway Heater

If required, however, the flue can project from the back of the apparatus and be inserted into an ordinary fireplace chimney.

Round the two heated boxes flows room air which is drawn in through gauze-protected apertures at the bottom. The warmed air rushes out at the top of the front grille and its momentum is enough to carry it some feet into the room before it begins to rise by buoyancy. A large volume of warm air is made to flow out of the top of the apparatus, while the products of combustion pass away to the outside air through the flue provided. Some of the difficulties which are associated with flueless heating are thus eliminated, and although the thermal efficiency is a little lower—it is approximately 75% as compared with 90% for flueless heating—this is claimed to be partially compensated for by the reduced amount of ventilation necessary. There is also an appreciable radiation component in the heat output which is probably about 10%, although this has not yet been measured. This radiation component, which comes from the front of the heat-exchanger, is useful to warm the floor and to provide a heat-focus—a spot where one can warm one's hands on a chilly morning before starting work.

The Attewell Engineering Co., Ltd., are preparing to issue 3 ft. long flue-casing sections which can be easily fixed to the wall. These sections will be finished in the same hammer-finished enamel as is used for the case of the heater, and by their use, it is claimed, a very neat installation can be made.

Under the stimulus of the Watson House staff, special attention has been paid to ease of maintenance. The heat exchanger is bolted together, and the unit can be taken from the case by removing four screws in the base of the appliance. The burners are reached by undoing seven screws in the bottom of the heater and the whole burner assembly then lifts forward after breaking the gas connection.

INTEGRATION AT WORK

by

G. F. OLIVER, M.Inst.Gas E., A.M.I.Mech.E. M.Inst.F.

Deputy Chief Engineer, South Western Gas Board.

THE economic aspects of integration were explored at a meeting of the South Western Section of the Institution of Gas Engineers at Exeter recently. Introducing the paper 'Integration at Work' by Mr. G. F. Oliver, Deputy Chief Engineer, South Western Gas Board, Dr. A. Marsden, M.B.E., Chairman, South Western Section, reminded the audience that subjects to be discussed during the present session had been based on a definite plan. The first two meetings had dealt with the raw materials, coal and oil, and, assuming gas was manufactured efficiently and cheaply from them, how it was to be delivered cheaply and efficiently where required.

For these earlier papers outside experts had been called in; but for the third paper, 'We have the expert within our own ranks,' Dr. Marsden continued. He had been delighted, he said, when Mr. Oliver had agreed to his request to present a paper on the 'difficult and interesting' subject of integration. Although much had been written on its physical aspects there had been little information of a factual nature concerning its effects. This Mr. Oliver had set out to supply.

Mr. Oliver then presented his paper, an abstract of which follows:

Forward Policy Adopted

Prior to 1949, 108 separate gasworks served the area which covers some 8,400 square miles, and is populated by approximately 3 mill. people. Only two gasworks had a capacity in excess of 10 mill. cu.ft. per day, the majority being small works. No less than 76 works had a daily capacity of less than ½ mill. cu.ft. and 36 of these made less than 20 mill. cu.ft. per annum.

At vesting date the South Western Gas Board adopted a forward policy based on the integration of the smaller works and the retention of selected larger works to form permanent production centres for the manufacture of bulk supplies of gas to the integrated works. This policy has been vigorously pursued for seven years and, up to the present time, 61 works have been closed down and bulk supplies afforded from major works.

Designed upon standardized lines, the system comprises some 820 miles of high pressure distribution mains, the majority of which is in spun cast iron, and of which 550 miles have been laid and are now in operation. The system includes mains of diameter ranging from 3 in. to 12 in. and is normally designed for maximum initial pressures of 30 lb. per square inch.

Whilst the whole scheme of development is not quite complete it is possible, at this advanced stage, to view critically and impartially, the results of the work done during these past seven years.

To assess the economies of integration, the following points must be considered:

(a) Between the initiation and completion of the work costs will have probably risen steeply, so that the set of figures which were true at the commencement do not necessarily apply when the bulk supply is afforded. For the sake of true comparison it is unfortunate that all the work carried out in the South West since vesting date has been caught up by the increased wages and cost of materials, involving a constant succession of supplementary estimates. An attempt is made in the paper to eliminate this factor in order to discover more clearly the true savings made through integration.

(b) The smaller undertakings in the South West, almost without exception, and certainly all those to which bulk supplies have now been afforded, were in a deplorable condition at vesting date. Priority in the integration programme was essential, for those where haste was necessary to obviate breakdown in supply. In all these works it would have been necessary to expend large sums of money for rehabilitation purposes as an alternative to integration.

(c) The expenditure of the sums referred to in (b) above for the replacement of plant, had they been expended, might have reduced the cost of gas into holder.

(d) If the required capacity is available, the addition of the load of the receiving station to the works selected to provide the supply, results in a decrease in the average cost of the total therms. In two or three cases plant capacity was not available, necessitating the construction of extensions and, in one case, a completely new works.

(e) Some of the permanent manufacturing works in the South West are situated on the coast where summer outputs are experienced. The addition of loads of the inland towns which they now supply and which have normal winter peaks has enabled steadier plant conditions to prevail.

(f) The extent of the load which it is possible to connect on the route of a bulk supply main is a factor which can be estimated with reasonable accuracy. In the South West hundreds of villages and hamlets are scattered throughout the areas between works and these will always be supplied by a trunk main passing through if possible.

(g) It is frequently possible to take advantage of a bulk supply main entering a town to improve local distribution pressure by the installation of suitable governors between the high pressure and low pressure systems. There have been many instances where this procedure has enabled projects for the improvement of supply, by the laying of larger or additional local mains, to be cancelled or postponed for a considerable period.

(h) There were many works in the South West which, prior to being afforded a bulk supply of gas, offered a service which could only be described as indifferent. The increase in gas sales immediately a constant supply became available has been most marked.

Improved Load Factor

(j) In every case where high pressure supply main from permanent manufacturing stations radiate in the direction of a neighbouring works they have been extended to form an interconnection between the manufacturing works. Their main purpose is to facilitate the exchange of gas between undertakings for the purpose of base-loading selected works. In addition, the total capacity of spare plant throughout the area may be reduced considerably, resulting in an improved load factor. There is also the advantage of a doubly assured supply to the smaller towns since many receiving stations can be supplied at will from two or more manufacturing works. A heavy additional demand for gas in any area, beyond the capacity of the works which would normally afford the supply, can be met, if necessary, by other adjacent works.

(k) In considering future sales and consumer service, there is a major factor which has been discussed at length by those concerned with the future of the industry—removal of organic sulphur compounds from town's gas. This is possible from the technical viewpoint, and the concentration of the load of 108 separate works into 15 large manufacturing stations will facilitate the adoption of this policy, when the way is clear for the installation of these plants, after the present difficulties of capital monies are resolved.

All these then are points which must be taken into account in assessing the economies of integration.

To obtain a true cost comparison and to eliminate inaccuracies in the assessment of savings achieved by affording bulk

SOMETHING MORE

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★ Automatic Hotplate Ignition

This new de luxe model
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window, to bring the housewife
into your Showrooms and
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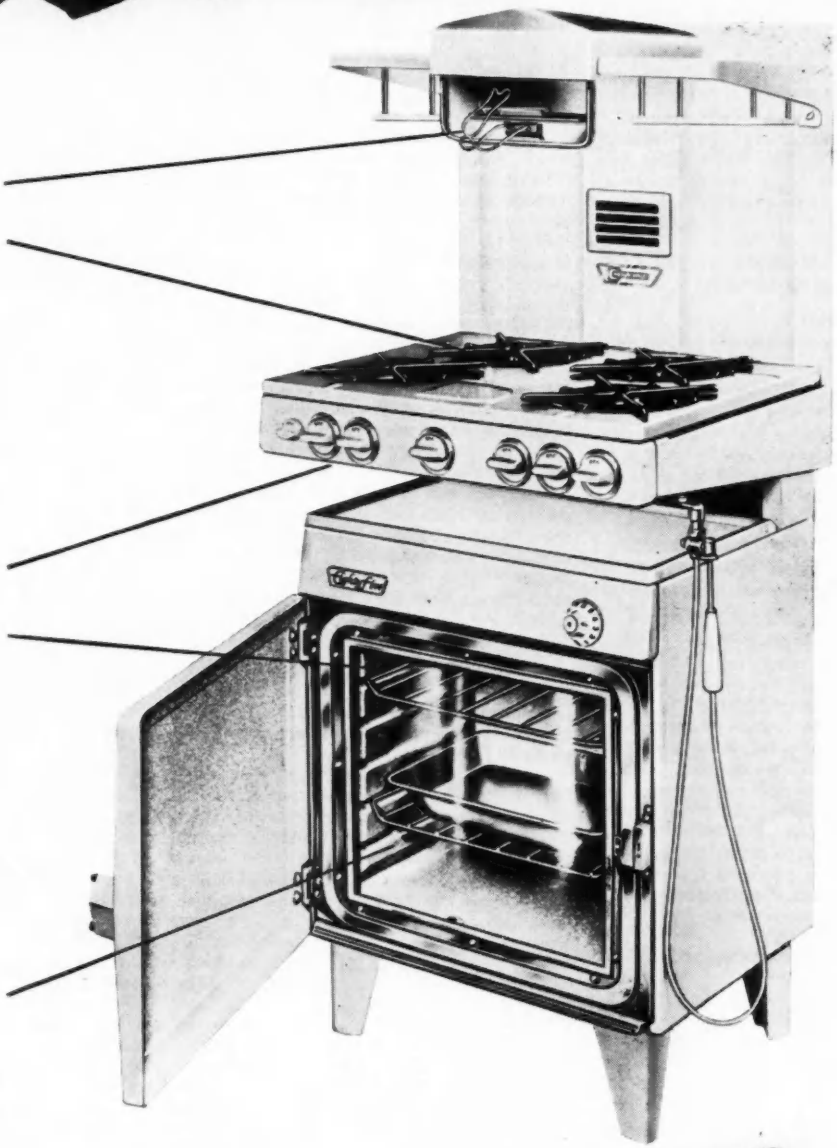

SELL NEW WORLD

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supplies to works shut down over many years, the last known cost of gas into holder at the receiving station has been adjusted upwards to the price levels which prevailed at the end of the last year of completed costs, *i.e.*, March 31, 1955. Costs of gas compression and freightage charges for coke have also been taken at the price level at March 31, 1955. The cost of gas for the last full year prior to being closed down has been taken to eliminate the effects of seasonal variations. In the case of works closed down after March 31, 1955, actual costs into holder for the full year ended March 31, 1955, have been used.

Capital expenditure on all distribution projects carried out since vesting date relating to integration have been aggregated. The costs include all mainlaying for integration purposes. In those cases where plant or buildings are also used for another purpose a proportional cost has been included. Depreciation has been based on the Evetts life of the asset, *i.e.*, cast iron mains 45 years (2.2%), mild steel mains 30 years (3.3%), buildings 60 years (1.66%), transmission plant and equipment, average 30 years (3.3%), and interest at the overall rate of borrowing is 4% and has been taken at the equated rate according to Archers Tables, over the Evetts life of the asset, i.e., at 2.6%. By the closing down of 66 gas making stations with a total annual output of 12,600,000 therms, a gross saving of over £360,000 has resulted.

The overall economic position for all integration carried out in the South West may be summarised as follows:

	£
1. *Actual Capital Expenditure*	
(*a*) Mains	3,135,695
(*b*) Gas transmission plant and machinery and buildings and governing equipment	272,858
Total	£3,408,553
2. *Annual Charges*	£
(*a*) Depreciation on	
(i) Mains	70,801
(ii) Gas transmission plant and machinery and buildings	9,403
(*b*) Interest on £3,408,553	88,622
(*c*) Maintenance	20,000
(*d*) Bulk coke haulage	39,593
(*e*) Cost of compression	18,837
(*f*) Transmission loss	9,498
Total Annual Charges	£256,754
3. Gross saving	£382,663
4. Less total annual charges	£256,754
5. Net annual saving	£125,909

Two large extensions to carbonizing plant were already on order by the former companies at vesting date—Bristol, a 10 mill. cu.ft. per day installation of continuous vertical retorts —Bath, an 8 mill. cu.ft. per day installation of continuous vertical retorts, together with a smaller plant of capacity 0.75 mill. cu.ft. per day for the Penzance Gas Company. These plants were ordered with no thought to integration but since all three Works are now affording bulk supplies to certain stations a proportion of the capital charges has been included.

We now consider savings at major works resulting from integration and increased efficiency and productivity. All the results quoted must be considered eminently satisfactory. It has been shown that after making all due provision for capital expended and after debiting all items which must be charged against integration there remains an annual saving of £125,909. Let it be stressed that this saving is only in respect of the 12,663,815 therms supplied annually to the 61 works which have been shut down since vesting date. But these savings are considered small when compared with the major savings which have been made at the permanent supplying stations in the overall reduction in cost per therm by reason of the concentration of the load.

Nevertheless, to make useful comparison it is necessary that a works should conform with the following conditions:

1. That the load has been increased by the addition of bulk supplies to several works between the years 1949-1956.
2. That no new coal gas making plant has been installed since 1949.
3. That the efficiency of carbonization which existed in 1949 is comparable with that which exists today.
4. That bulk supplies have been afforded for a period of at least one year in order to obtain reliable costs.
5. That the load, excluding that afforded for bulk supply purposes, has remained reasonably constant.

One works only, throughout the whole of the area, conforms with these conditions and the following comparison has been made in respect of this one works. The detailed items making up the cost of gas into holder for the year 1950/1951 have been recalculated in terms of current price levels giving the following results:

Total gas made 1950-1951	7,301,933 therms
Total gas made 1955-1956	9,368,448 therms
Cost of gas into holder 1950-1951 actual	8.73d. per therm
Cost of gas into holder 1950-1951 recalculated in terms of 1955-1956 prices as above	11.25d. per therm
Actual cumulative cost into holder for year 1955-1956	9.67d. per therm
Saving	1.58d. per therm

The difference of 1.58d. per therm on the therms supplied from the works, excluding bulk supplies, *i.e.*, approximately 7,300,000 therms, represents an annual saving for this one works alone, of £48,000. Whilst this figure cannot be applied to the area as a whole it indicates the order of the savings which are being made as a direct result of the improved loading of the permanent stations.

It is interesting to review the extent of the savings in coal which has resulted from the Board's policy of integration. With the soaring cost of coal and the difficulty of obtaining suitable qualities in sufficient quantities it is more than ever essential to attain the highest efficiency possible in carbonization. This has been done by the transfer of the loads of small inefficient works to a major manufacturing station having a much higher efficiency, and by the steady increase in the thermal yield per ton of coal which has been obtained over the past seven years at the supplying stations, partly due to their improved load factors. Further reductions in coal demand will shortly result from the introduction of complete gasification plants, and plant to gasify oil from a wide range of feedstocks.

The effective improvement in carbonization efficiency has been to increase the therms per ton of coal carbonized from 71.20 in 1949/1950 to 75.03 in 1955/1956—an improvement of 5.4% in seven years. During the same period the coke and breeze produced ex retort house has increased from 11.12 cwt. per ton to 11.52 cwt. per ton. This increase of 0.40 cwt. per ton of coal carbonized has resulted in an additional 31,000 tons of coke for sale annually, together with a saving in coal of 86,000 tons in the year 1955/1956, and cumulative savings since vesting date amounted to no less than 278,000 tons.

Lessening Demand

A chart (Fig. 1.) has been prepared to show the trend of coal requirements from 1949 and forward to 1961/1962 and to illustrate the lessening demand for coal occasioned by increased efficiency of carbonization and by non-traditional methods of manufacture.

Starting from the tonnage of coal carbonized in the year 1949/1950, namely 1.4 mill. tons approximately, the hatched band represents the tonnage of coal which has been saved by the integration of the small Works and the increase in efficiency of carbonization. The upper line of the band represents the total coal requirements had none of the small works been closed and had carbonizing efficiency continued at the 1949 level of 71.20 therms per ton. The lower line of the band represents the actual tonnage carbonized to 1955/1956 and an estimate to 1961/1962 of the coal which would have been required had not other methods of gas manufacture been planned.

The vertically hatched band represents the savings in normal coal requirements estimated to arise from the introduction of complete gasification plants producting approximately 180 therms per ton instead of the normal carbonizing figure of 75 therms per ton. The area shown cross-hatched indicates the increasing extent to which it is anticipated that oil will replace coal in the production of gas, while the horizontally shaded portion indicates the tonnage of the weakly swelling coal—unsuitable for normal carbonization—which will be used in the complete gasification plants. It will be noted that the current year 1956/1957 represents the peak of coal requirements.

Of the more important benefits which follow integration mention should be made of the effect of the pooling of gasholders. Frequently, in the past, the use of peak load plant was necessary to cater for sudden increased demands of a temporary nature. With many gasholders connected to a common grid it is possible, to a very large extent, to level out these irregularities in demand. With the facilities afforded for the inter-

change of gas between major production units it is possible to concentrate peak load plant in large economical units at two or three selected works. A reduction in C.W.G. manufactured in 1949 of 17% of the total to about 7.5% in 1955/56 illustrates this point. It is planned that all continuous vertical retort and intermittent vertical chamber oven carbonizing plant will be in full output throughout the whole of the winter, and a reasonable proportion is let down in the summer for resetting and repairs. Carburetted water gas will only be necessary in the future on peak winter days.

The completion of the interchange mains between the permanent manufacturing works has made possible the overall planning, on an area basis, of an annual gas production programme. An annual output chart for the area is prepared with fair accuracy upon which the outputs of each plant are built up. The period during which any particular bench of retorts will be in operation is thus planned in advance.

Labour

Whilst, of course, the cost of labour is included in the figures already quoted a brief examination of the numbers of persons employed brings into clear relief the savings in manpower which have been achieved through the integration of the smaller works and by the greater and increasing degree of mechanization which is possible at the larger supplying stations.

The difficulties of securing suitable labour to operate gas works processes are well known and have been experienced in full in the South West. These difficulties have been tempered by the overall reduction in the demand for labour and by the transfer of men to the permanent manufacturing works. The number of persons employed on production has fallen from 3,583 in 1949 to 2,883 in 1956, during which period there has been a small but steady increase in gas output.

The output of gas per production employee in 1949/1950 was 33,863 therms and has shown an increase in the intervening years to 46,800 therms per employee in 1955/1956. The increase—the equivalent of 38%—must surely compare very favourably with other industries. During the same period the coke and breeze produced per production employee has risen from 290 tons in 1949/1950 to 390 tons in 1955/1956.

The term 'base-load operation' involves, for the works selected to operate under these conditions, the continuous and steady operation at optimum output, and over long periods, of all available coal carbonizing plant, completely irrespective of seasonal demands and local peak load variations. This fixed optimum output can be related to the annual load curve at any level; it can equal, or even be in excess of, the maximum daily requirements of the district normally supplied; it can equal or be less than the minimum daily requirements. The conditions involve, of course, either the disposal of surplus gas to other works or to a common grid, or the acceptance of gas from a peak load station at times when local demand exceeds the output of the base-load plant.

While one or two works have been placed on this method of working and the benefits are beginning to accrue, they can only be fully gauged over a period of years. The many advantages to be gained can be seen from the following points:

(a) In normal times, immediately following the installation of a gas making plant at any one works, there is probably a surplus capacity due to the fact that the installation is larger than that required for the immediate demand, because of allowance for normal development. It may be two or three years before this surplus capacity is overtaken by consumption. If this process is being repeated at a neighbouring undertaking then, by staggering the building programme, surplus gas can be transferred from one undertaking to the other, according to the installation of plant and the increasing consumption. In this way locally surplus carbonizing plant can be efficiently employed, thus making the utmost of capital expended and a cheaper overall therm by reduced use of carburetted water gas plants.

Repair Programmes

(b) Resettings and repairs can be spread more evenly over the year by the planned dovetailing of repair programmes of connected undertakings.

(c) Economies are effected in fuel and power consumption by the continuous and steady running of works plant.

(d) Day to day variations in demand and peak loads are taken by a minimum number of works which are being designed and equipped to undertake this function.

(e) It is possible to reduce the total carbonizing plant requirements of two neighbouring undertakings whose peak outputs occur at different times of the year.

(f) An insurance against serious breakdown whereby the need for standby plant and gas storage is reduced.

(g) Ideal conditions are promoted for the utilization of waste heat. Frequently it is found necessary to take a waste heat boiler out of the line simply because there are insufficient beds under fire in the bench to keep the plant working. The saving

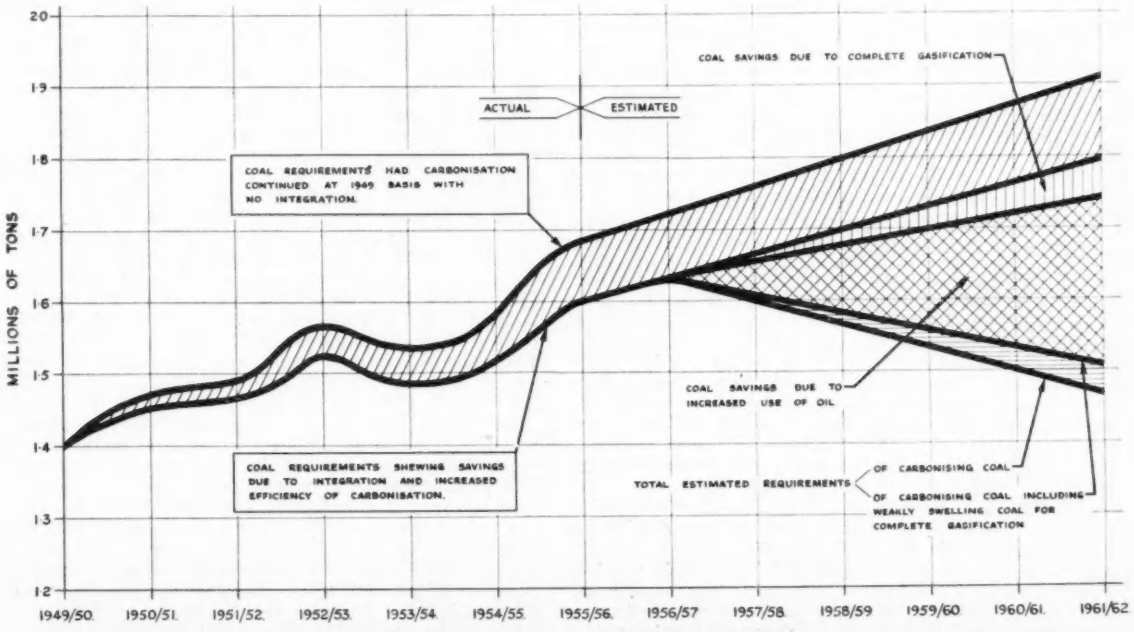

Fig. 1. Coal requirements and savings due to increased efficiency of carbonization and to new methods of manufacture.

in solid fuel on other works boilers is appreciable.

(h) Maximum coal carbonizing efficiency can only be obtained when plant is running on a steady optimum schedule, without variation or interruption, over long periods.

(j) The heating up and letting down of beds of retorts, is reduced to a minimum.

(k) Some appreciable extension is expected from the life of retorts due to steady running.

(l) Economies in handling charges, particularly in the operation of mechanical shovels, cranes and other mobile machinery used for the stocking and reclaiming of coal.

(m) The wages expended per therm both for plant operation and for repair of retorts, general repairs and salaries, *etc.*, show improvement due to the higher load factor.

(n) A tendency to ease those labour troubles caused by intermittent working of plant.

(o) The convenience of having manufacturing stations connected in times of war.

The interconnections between permanent manufacturing stations have been designed, broadly speaking, to pass a sufficient volume of gas to enable seasonal variations to be levelled out. Whilst these connections are not quite complete twelve of the final sixteen stations are already interconnected to one or more of their neighbours.

DISCUSSION

Opening the discussion which followed, **Mr. J. W. Dean,** Engineer and Manager, Plymouth/Cornwall Division, congratulated Mr. Oliver on an excellent paper, and said that they were lucky in having a system of integration mains capable of coping with any new development which might arise. The mains were only moderately stressed now and in his opinion would outlive the 40-odd-year limit which Mr. Oliver had given as their natural depreciation life. They constituted a tailor-made system for new processes which might be evolved. Turning to base loading, he said that consideration would have to be given to the problems of the distribution engineer in isolated areas which would be considerable; decisions would have to be made as to which stations were to be base loaded. This also had implications as far as coke was concerned. He questioned whether all the major manufacturing stations denoted in the paper were not in positions which rendered them liable to enemy attack in the case of war. Mr. Oliver agreed that the mains could cope with the load which would be placed on them. Decisions concerning base load stations would be made in the near future. He felt that risk of enemy action was not such as to threaten the ability of the system to carry on effective suplies.

Mr. H. J. Stapley, Area Assistant Engineer, Exeter Division, said it was easy to talk about savings produced by integration, but not easy to produce facts. It was unfortunate, he continued, that the official financial axe had fallen on sulphur removal. Decreased maintenance costs and increased gas sales would pay for the installation of removal plant. Mr. Oliver said that the concentration of load would facilitate the installation of sulphur removal plant. Dr. Marsden expressed the opinion that while sulphur removal might be under the axe they might soon be in a position where they could not afford not to remove it.

'Absorbing Interest'

Mr. O. H. W. Boonham, Production Engineer, Cheltenham Division, said that the subject matter of Mr. Oliver's paper was of 'absorbing interest.' The production engineer was aware of the changes that were taking place but might not realize the extent of the savings involved. He felt that Mr. Oliver might have under-estimated savings effected in his paper. The S.W.G.B. was not lagging in productivity, he continued, and asked whether, had the saving in coal consumption in the area quoted in the paper not been affected, it would have been possible to obtain the balance of supply that would have been needed. He questioned whether it had been wise from the point of view of labour relations, to give advance information regarding stations scheduled for closure; and also queried the effect on the clean air policy of the declining use of coal for gas making indicated in the paper. Mr. Oliver said that had the saving of coal not been effected additional needs could not have been met and more water gas would have had to be made. He had not intended to upset labour relations in specifying stations to be closed, and pointed out that he had given no dates for the implementation of these plans. The relationships between decreased use of coal in gas making and clean air was a matter of viewpoint. If more gas were manufactured it could be used to fire producers, while the use of oil for gas making did not produce smoke at the gasworks .

Mr. T. H. Pardoe, Area Industrial Gas Engineer, questioned whether a bigger saving might not have been effected with the use of propane gas. He suggested that the productivity improvement given in Mr. Oliver's paper indicated that productivity must have been 'damn' bad' before integration started. Mr. Oliver said that they had tried propane and were abandoning it as being a less economical proposition owing to transportation considerations. Regarding improvement in productivity, he could only say that figures given in his paper were arrived at after careful consideration and they had been very pleased with them.

Mr. J. W. Denton, Divisional Engineer and Manager, Torquay and Exeter Division, was pleased that Mr. Oliver had stressed the need for the efficient use of gas holders: It was no good achieving base load working if base load distribution did not go with it.

Mr. W. J. Baker, M.B.E., Board Member, S.W.G.B., asked if Mr. Oliver could substantiate his figure of 2% loss of transmission given in his paper. Mr. Oliver agreed that the figure might appear excessive and could not be proved, but pointed out that it was in respect of a period of 40 years and as such was a conservative figure. Mr. Baker also questioned whether other Boards might not query some of the major figures arrived at in the paper, for example the saving of 1.58 pence per therm at one works. Mr. Oliver said that the figures had all been gone into very carefully and he believed them to be accurate. He agreed with Mr. Baker that he might have summarized his paper to better advantage but said that he had been prevented from doing so by limitation of time.

Instrumentation

Mr. A. C. Rea, Station Engineer, Bath, also stressed the need for engineers to get together to ensure most efficient use of gas holders. Mr. Oliver pointed out that this question did receive attention in his paper, although he had not dwelt on it in his presentation. Mr. Rea also questioned the omission of reference to instrumentation in the paper to which Mr. Oliver explained that he had not included the subject as he had endeavoured to keep to the economics of integration. Mr. Rea also felt that Mr. Oliver should have given more consideration to the economic aspect of coke and breeze which now contributed a large percentage of revenue, and criticized the reliance on horizontal retorts.

Mr. P. J. Whitehead, Production Engineer, Swindon Division, also questioned the saving of 1.58 pence per therm given in respect of one works. Had a fair comparison been made, he wondered, and could the same figure be achieved, for example, at Swindon? Mr. Oliver said that the figure did not apply to all works. It could not be achieved at Swindon as the plant was inadequate. In reply to a further query by Mr. Whitehead who felt that 45 years was excessive as the estimated life of existing mains, Mr. Oliver disagreed and said that he considered the figure quite reasonable.

Mr. J. Foxton, Cheltenham, said he had no doubt integration could be financially successful, but it could only become so when interchangeability of gases had been achieved—would that be the case when the use of thermal cracking was adopted? There would, he continued, be differences of C.V., and complaints among station engineers. Mr. Oliver said that interchangeability was not essential, although the full benefits of integration would not be reaped until it was achieved. Regarding oil gas, Dr. Marsden said that advice and information could be obtained from the United States.

Mr. James Carr, Deputy Chairman, S.W.G.B., added his congratulations on Mr. Oliver's paper, and recalled that Mr. C. H. Chester had effected a large measure of integration in the Swindon area before nationalisation was even effected. The same was true also of Weston and Bath.

A vote of thanks to Mr. Oliver was proposed by **Mr. T. W. Jackson,** Divisional Engineer and Manager, Bristol/Bath Division, who said that he had summarized seven years' hard labour in an excellent paper. **Mr. F. C. Gay,** M.B.E., Manager, Bristol District, proposed a vote of thanks from the Section to the Board, and to Mr. Denton for the arrangements made for the meeting.

UNACCOUNTED—FOR GAS*

BY C. J. POPE, ASSOC.M.INST.GAS E.,
Engineer and Manager, Abercarn, Wales Gas Board.

THE several factors normally grouped together under the term 'unaccounted-for-gas' may be expressed as a percentage of the total volume made or received, or as the number of cubic feet lost per mile of main, or as the number of cubic feet lost per consumer. The I.G.E. Report of the Sub-Committee on Unaccounted-for Gas standardizes to a large extent the methods of correction for changes in physical conditions, allowances to be made for un-read gas, *etc.*, thereby allowing some comparison to be made between undertakings, However, one should not allow oneself to be lulled into a state of false security by low unaccounted-for figures. All that can be said is that most of the gas sent out has been accounted-for. It does not necessarily follow that maximum efficiency has been achieved.

Consider a small undertaking with a 'make' of say 10 mill. cu.ft. per annum. The acquisition of one large industrial consumer can have the effect of reducing the unaccounted-for figure tremendously when expressed as a percentage of the total volume made, although the actual quantity of gas lost due to leaking mains and services and incorrect meters remains substantially the same. Again, should a district be supplied with gas at unnecessarily high pressures, the loss due to the 'slow' registration of meters can be accounted for by applying a correction factor for temperature and pressure to the quantity of gas which passed through the consumers' meters. This reduces the unaccounted-for figure but does not bring in revenue for the extra B.Th.U. presented to the consumer.

Correct registration of station meters is, of course, of prime importance, and can only be obtained by frequent proving, daily checking of oil or water levels and efficient regular lubrication. These errors due to the measurement of gas under different physical conditions have to be taken into account. Recommendations on this aspect were set out in the I.G.E. Report mentioned, which contains a method for arriving at a 'correction factor' for gas sold which allows for changes in temperature and pressure.

Average Temperature

The gas sold is that amount of gas which passes through the consumers' meters plus an estimated figure for any un-metered gas. This is the volume which has to be corrected for temperature and pressure. To obtain the greatest accuracy, the average temperature and pressure should be that average obtaining at the consumers' meters weighted to allow for the fact that different quantities of gas may pass at different times of the day. A factor is added to, or deducted from, the average weekly temperature of the atmosphere obtained from maximum and minimum shade temperature. The maximum and minimum temperature are averaged daily and the figures so obtained again averaged to give the average weekly temperature. The addition or deduction figure is given in a table in the I.G.E. Report.

The pressure is arrived at by averaging the daily pressures obtained over the week. The daily barometric pressure may be taken from a barometer at the works or from published figures.

The average figure is then corrected for any difference between the average altitude of the consumers' meters and the altitude of the barometer, and for the normal gas pressure at the consumers' meters. Using the temperature and pressure figures thus obtained, the correction factor is taken weekly. The quarterly figure is arrived at by averaging the weekly figures weighted according to the quantity of gas delivered from the works.

The phrase 'weighted according to the amount of gas delivered weekly,' calls for comment. The addition or deduction to the figure obtained must be arbitrary and will depend very much on the engineer's interpretation of his figures. A simple data-sheet has been prepared which requires no skill in its compilation. The information required has to be obtained for the evaluation of the 'correction factor' and for the 'return of gas made or bought' which is sent to Board Headquarters every week. It is, therefore, a simple matter to apply this factor to the gas made or bought to obtain a correction figure for the week. This is carried forward to give a final correction figure based on the gas made or bought during the quarter.

The gas sold is the gas made or bought less the unaccounted-for. An estimated percentage unaccounted-for figure can be obtained by including the whole of the correction obtained above. The estimated percentage is then applied to the original correction figure giving a true figure for a correction based on gas sold. This is then taken forward into the final evaluation of the quantity unaccounted-for.

Unread Gas

It might be as well to look into the methods of assessing the figure for unread gas at this stage, since this also has certain arbitrary features. The method generally adopted throughout the Wales Gas Board area is that which has become known as the 'Chief Accountant's Method.' The total repayment sales for the quarter or for the final collection period where more than one collection is made per quarter are halved and weighted to cover any known variations in sales or numbers of consumers. In the case of ordinary consumers whose meters are read during, say, the last week of the quarter, no allowance is made; where continuous quarterly reading is practised, the same procedure as above is carried out. Bulk-supply meters and those with large consumptions should always be read on the last day of the period.

The increase or decrease in the amount of unread gas over the previous quarter is included with the 'gas sold' figure, which in turn, increases or decreases the quantity of gas unaccounted-for. Any variation in the cash value of the unread gas over the previous financial period is also taken into the revenue account.

Here again, a method not requiring weighting is available. This method is fully explained in the I.G.E. Report of the Sub-Committee on Unaccounted-for Gas. However, to obtain accuracy, a certain amount of time and energy must be given to the problem—time which can be ill-afforded by the smaller undertaking. The 'Chief Accountant's Method,' therefore, has ease and simplicity and can be accurate if the weighting is sound.

Having calculated the unread gas over several quarters by both methods, it is interesting to note that the increases and decreases over previous quarters were comparable and that the basic figure calculated by the method given in the I.G.E. Report was far lower than that arrived at by using the 'Chief Accountant's Method.' If a change to the method outlined in the I.G.E. Report was contemplated, one would expect in the first year that the unaccounted-for figure would increase and that the revenue account would suffer a reduction.

Loss from Holders

Gasholders are responsible for much wastage. Gas can be lost either by leakage or by over-filling. Leakage can be reduced, if not eliminated, by comprehensive inspections of all holders at least once every month. All rusty parts should be scraped and painted, all rollers greased and adjusted and a detailed inspection carried out for leakage. A check on the depth of cup seals should be carried out every day.

Overfilling or blowing is inexcusable and is the product of sheer inefficiency, or complete lack of supervision. Overfilling usually occurs at night when stocks are being built-up for the

* From a paper to the Wales and Monmouthshire Junior Gas Association, April 19

following day. Thus, apart from being not able to estimate the gas lost, the engineer is more often than not unaware that overfilling has occurred.

On the smaller undertaking, the fitting of a meter on the holder outlet main can have highly beneficial results. The gas lost will be shown by the difference in the inlet and outlet meter readings. When such a scheme was put into practice at one small undertaking, the total unaccounted-for was reduced by about 50%.

Chief Causes

Leakage from mains is chiefly due to joint failure, fractured pipes or corrosion, while that from services is generally due to corrosion. Leakage can be minimized by careful control of pressures. The aim should be to provide the best possible service to the consumer while avoiding excess pressure, for any leakage is increased in direct proportion to the square-root of the pressure and the registration of the consumers' meters will be about 1% slow for every 4 in. W.G. increase in pressure.

Disused service pipes are often the source of loss of gas, the undertaking sometimes having little or no check on the condition of these pipes. Following the disconnection of gas from a premises vigorous attempts should be made to re-introduce the use of gas over a specified period of, say, one or two years. If sales cannot be resumed, then the service should be cut off at the main and not allowed to remain as a potential source of leakage.

Reference has been made to the use of station meters on holder outlet as a means of establishing the amount of gas lost from the blowing of holders. Such a meter can serve a further purpose—it can also provide accurate information on the total leakage of the distribution system by making a check on the flow through the meter at 'no load' periods. The time for this test varies between undertakings but from 2 to 3 o'clock in the morning appears to be the most suitable period. Allowances should be made for bypasses or other known usages.

As an indication of the accuracy of such a test, the following results obtained at a small undertaking in West Wales are given. Under 'no-load' conditions, the minimum quantity of gas flowing through the meter was of the order of 50 cu.ft. per hour. The whole of the distribution system was tested by isolating sections of main and the leakage on each section proved by a test-meter. The testing was carried out during the daytime and all consumers' maincocks were turned off for the period of the test. The accumulative total of leakage in all the sections was found to be within ½ cu.ft. of the figure arrived at by the checking of the outlet station meter. Any increase or decrease in the gas lost *via* the distribution system can be quickly ascertained by periodic testing under 'no-load' conditions. In passing, it should be mentioned that such a meter would also provide accurate figures on maximum hour and instant peak-load throughputs.

The cost of such a large capacity meter and its installation cannot, in general, be justified by a small undertaking and so the following method has been used with just as much success. A 450 H.C. meter with large dial is fitted across the holder inlet and outlet mains by means of flexible hose couplings. At an appropriate time, say 2 a.m., the holder outlet should be closed and the holder outlet syphon flooded. All gas passing to the distribution system must flow through the meter. Tests are carried out as previously stated and the holder outlet syphon pumped dry and the valve opened on completion of the test period. This method is both cheap and effective.

In Situ Meter Testing

There can be no doubt as to the need for the periodic testing of all meters installed on the district, and several reasons justify the testing meters *in situ:*

1. It is less costly to check the registration of meter *in situ* than to recover these meters from the district for examination on the test-bench.

2. Transport shock, by dislodging foreign matter adhering to valves and valve faces, *etc.*, will alter the registration of an inaccurate meter to a considerable degree. Therefore, the testing of meters *in situ* may be said to give a more accurate picture of the trend of registration inaccuracy in any registra-

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tion survey than can be obtained by the recovery of quantities of meters from the district for checking on the workshop test-bench.

3. The substitution of the consumer's meter by a temporary meter entails extra book keeping work in order to account for the cash if a slot meter, or an entry in the meter-reading book if an ordinary meter.

4. A consumer may have reason to believe a meter to be registering erroneously but will not request the removal of the meter for testing because, should the meter register correctly, the expenses incurred in removing, examining and replacing the meter may be charged to that consumer. A quick *in situ* test would put this consumer's mind at ease, the Board thereby giving satisfaction at very little cost to themselves.

5. In the smaller undertakings, the cost of equipment necessary to set up a small testing station is out of all proportion to the amount of use the equipment will receive. Central testing stations are not practicable because of transport costs and the effect of transport shock.

Experimental work has been undertaken by the Board on the *in situ* testing of meters using portable test meters and governed and calibrated burner assemblies. The respective merits of both methods have been examined in detail and the following information is of note.

(1) When using a portable test meter, large errors may arise through differences in temperature between the test meters and the meter being tested, but changes in specific gravity do not affect the accuracy of the test. Any inaccuracies in the test meters are transmitted to the meter being tested. Consequently it is necessary to check the test meter at regular intervals against a test holder or large capacity wet meter. The equipment is bulky and needs to be handled carefully.

(2) Normal systems of calibrated and governed burner assemblies can only be used at small rates of flow and cannot be used for 'capacity' tests. Inaccuracies due to temperature changes are reduced to a minimum but changes in specific gravity do affect the accuracy of the test.

(3) A change in specific gravity of 0.01 gives an error equivalent to a change in temperature of 10° F., this error being slightly in excess of 1% fast or slow in the 'meter percentage error' charts.

Experimental Instrument

An experimental instrument has therefore been developed using calibrated and governed jets having a far greater range of flow than the normal burner assemblies. The operation of the instrument depends upon the fact that when gas of constant specific gravity is passed through a fixed orifice at a given pressure the quantity of gas which issues from the jet is in direct proportion to the time taken to pass that amount. The only variable which cannot be controlled is the specific gravity. The pressure at the jet is controlled by a governor and the jet itself can be pre-set to pass the required volume. Thus the quantity of gas issuing from the jet in any given time can vary only if the specific gravity varies.

If a jet is calibrated to pass 100 cu.ft. of gas per hour at a pressure of 2 in. W.G. and of a definite specific gravity, the time taken to pass 2 cu.ft. will be 72 sec. The conditions remaining constant, the time taken to pass a specified quantity of gas, or conversely, the quantity of gas passed in a specified time, can be calculated. However, if the specific gravity changes, the quantity of gas passing through the jet in any given time will also change, since the quantity of gas passed varies inversely as the square root of the specific gravity.

It is therefore possible to construct meter percentage error charts in terms of 'time' as opposed to the normal volumetric method of expression since each individual jet is calibrated to pass a specified quantity of gas of a specific gravity equivalent to the average value obtained from statistical information supplied by the undertaking at which the instrument is to be used, and at a pressure of 2 in. W.G. The meter percentage error chart constructed from this data becomes the 'master-chart.' A separate chart is supplied for each 0.01 difference in specific gravity, covering the full range of specific gravities likely to be encountered in that particular undertaking.

Since it is impractical to check the specific gravity each time a meter is tested, the procedure to be adopted would be to obtain a specific gravity value at some convenient point on the town supply before the meter-tester proceeds to carry out tests in the morning, and again after lunch, before further tests are carried out in the afternoon. The meter-tester will then be able to carry with him the correct chart for that particular period.

Sufficient information is available to show that the specific gravity of the gas on the districts of undertakings supplied *via* the Grid varies very little from the values obtained at gasholder outlets if tests are carried out twice a day. In the case of undertakings manufacturing gas but possessing two holders, a specific gravity test should be taken each time the town holder is re-filled from the 'make' holder. A slight deviation from normal routine can often ensure that the town holder is filled before the morning testing period and refilled during the dinner-hour in readiness for the afternoon period of test. Manufacturing undertakings with one holder only might have difficulty in obtaining a constant specific gravity.

Results Promising

Although the number of tests carried out with the instrument have been limited, the results are most promising.

Meters defective due to 'passing unregistered gas' outweigh the total number of meters defective for all other reasons. It may be as well therefore, where *in situ* meter testing is being carried out for the first time, to concentrate on the replacement of meters passing unregistered gas. This test can be carried out quickly by the use of a series of governed burner jets. Such an appliance is available in a compact form, the jets being mounted on swivel taps and the burner manifold forming the swivelling base. By combination of these jets, the flow through the burner assembly can be increased from 1 cu.ft. per hour to 5 cu.ft. per hour. Where a meter is suspected of passing unregistered gas, this burner assembly is fixed to the outlet of the meter, and the rate of flow increased from 1 cu.ft. per hour until some indication of registration is noted.

Leakage from mains and services normally amounts to less than 1% of the gas made or bought. Most undertakings however, have not fully recovered from the effects of the last war when materials and labour were virtually unobtainable. Temporary or partial repairs were, more often than not, the only solution. The tremendous amount of post-war work in connection with housing sites, *etc.*, has also placed additional burdens on the original distribution systems and it is felt that some method of testing mains and services is necessary if leakage is to be reduced to a minimum.

Until such time as an obligation is placed upon undertakings to test all meters within some specified period, an organized system of *in situ* meter testing is necessary. The failure of a meter to record a ½ cu.ft. per hour pilot flame can mean an annual loss of revenue of about £2 2s. with gas at 2s. per therm. Failure to record 1 cu.ft. per hour makes a refrigerator a very poor proposition indeed.

Finally, it might be argued that in the computation of the cost of the gas lost, the basic figure should be the bare cost of manufacture since it does not follow that the gas lost would have been utilized by the consumers. This assumes that adequate supplies are available to the consumers. However, very few undertakings are able to carry on throughout the year without manufacturing or purchasing peak-load gas. This is an extremely expensive item. How often has the volume of peak-load gas manufactured or purchased been equivalent to, or less than, the amount unaccounted-for?

Experience will be Needed

The opinion that the Clean Air Bill is kindly and in line with the tone of the Beaver Report, which urged that the public should be led to act voluntarily toward the achievement of better living conditions and not made to feel that they were being coerced, was expressed by Mr. J. B. M. Mason in a paper, 'Air Pollution Problems and their Cure,' read before the London branch of the Incorporated Plant Engineers, recently. The paper is reproduced in the current issue of this body's publication, 'Journal.' But, goes on Mr. Mason, kindly handling could be replaced by waste of time on legal arguments by the over zealous local official. He sees the need for a co-ordinating body, or for the sanitary inspector, who will play an important role in the enforcement of the new legislation, to have sufficient experience in fuel engineering to be able to advise industrialists who are making smoke.

A Familiar Pattern*

By W. SUTCLIFFE, B.Sc., M.Inst.Gas E.,

Divisional General Manager, Tyneside Division, Northern Gas Board.

BLYTH Division can be divided principally into two zones. In the south east there is a densely populated industrial area, bounded by Blyth, Morpeth and Amble, depending for its prosperity largely on coal mining and shipping. In many respects this zone can be looked upon as a northerly extension of Tyneside. North of this industrial zone, agriculture and its associated trades form the major activities, and its character varies from the rich cultivated area of the eastern coastal plain, to the moorland hill farms towards the west.

As could be expected, gas supplies at vesting date were confined to the towns and larger villages comprising Blyth, Bedlington, Morpeth, Newbiggin and Amble in the south east, and Alnwick, Berwick, Wooler and Rothbury in the northern zone. Sales of gas were predominantly to domestic consumers, and, especially in the mining areas, 'concessionary coal' depressed the consumption per consumer to a low level.

Blyth, including the neighbouring Bedlington, which was supplied in bulk from Blyth, represented some 57% of the total output of the Division. Although of old design, the continuous vertical retort installation was in good condition, and an order had been placed for additional carbonizing and coke handling plant. Although storage was limited the distribution system was in good order, as the low pressure mains could be reinforced, when necessary, towards the west from the high pressure feeder main to Bedlington, and to the south west by a semi high pressure main and necessary boosting plant, which was about to be completed.

Increase in Demand

Morpeth, which was an integral part of the Newcastle and Gateshead Gas Company, was connected to the Newcastle distribution system by an 8 in. high pressure main, but because of the rapid increase in the demand for gas experienced on Tyneside since the war, it had not been found possible to shut down the Morpeth works completely. These works were operated in effect as a base load station.

Relations with local authorities and consumers varied considerably; for example in Alnwick and Morpeth, all local authority houses were equipped with gas appliances, in Blyth only 50%, and in other units, gas was to all intents excluded from their post-war housing schemes.

The programme of work which faced the Division followed the now familiar pattern. Although the general pattern soon became clear, it is not intended to give the impression that all these decisions were in our minds from the beginning, or that they were made in the order set out—far from it, but looked at in retrospect, it is suggested that they represent a reasonable solution to the problems with which we were faced. It was decided to:

(a) Connect the existing Blyth to Bedlington high pressure main to the Newcastle-Morpeth high pressure main, thus providing an essential link between Blyth, Morpeth and Tyneside.

(b) Increase the productive capacity at Blyth works in two stages to 3 mill. cu.ft. per day, this being considered the maximum production possible on the existing site, and redeclare the calorific value from 450 to 475 B.Th.U. per cu.ft.

(c) Extend the high pressure distribution system from Blyth forward to Newbiggin, the main to be large enough to meet foreseeable demands in those parts of Bedlingtonshire which were not yet supplied, and to meet anticipated demands in Ashington; it being understood that the rate of development in these areas would of necessity be slow.

(d) Eventually to connect Morpeth and Ashington by a high pressure main, and to make a further connection between Blyth and the southern section of the Newcastle high pressure network, which in the future would be fed essentially from the new Howdon works, at that time under construction. With these projects completed, it would be possible to cease production at Morpeth and Newbiggin, and to open up possibilities for greatly increased consumption in Bedlingtonshire and Ashington. This would enable the Blyth works to operate as a base load station, and play its part in the projected East Coast Grid.

(e) Rebuild the Alnwick carbonizing plant, making full use of material made redundant by the reconstruction of the Howdon works of Tyneside Division; to install a coke grading plant, benzole recovery plant, and a new 250,000 cu.ft. capacity gasholder.

(f) Lay a high pressure main from Alnwick to Amble, supplying the villages of Shilbottle and Warkworth en route, and to lay a high pressure main from Alnwick to Rothbury. When completed these projects would enable both the Amble and Rothbury works to be closed down.

(g) Continue production at Wooler. As both the Alnwick and Wooler carbonizing plants consisted of horizontal retorts it was decided not to alter the declared calorific value at Alnwick, which was 500 B.Th.U. per cu.ft., but to declare this value in Amble, Rothbury and Wooler.

(h) Modernize the Berwick works by installing a new carbonizing plant, consisting of nine intermittent vertical chamber ovens, with a nominal capacity of 550,000 cu.ft. per day, and to provide a coke handling and grading plant.

The major portion of the work will be completed this year, resulting in a reduction in the number of manufacturing stations from eight to four, of which three will have been modernized, and some 40 miles of high pressure main will have been laid. The capital expenditure on these major projects amounts to approximately £560,000.

The increased cost of carbonizing coal has more than covered savings from the greater efficiency of more modern plant and benefits from integration schemes. Additional plant capacity is still needed to meet normal increases in demand for gas. But the limitation on capital expenditure, the (albeit vague) prospect of natural gas supplies, from at home or abroad, and the possibility of underground storage, makes new plant of conventional design more difficult to justify. For some years to come it will be more than ever necessary to concentrate on improving the efficiency of existing plant.

Fields of Improvement

Another look at our methods in all branches will, I feel sure, reveal fields of improvement at a comparatively low expenditure. Reduction in production costs is only one side of the problem; a similar effect can come from increased efficiency of utilization. The work of our industrial departments has made substantial economies possible in furnace operation. Equally substantial improvements have been made in the efficiency of domestic appliances.

The Symposium on Coke outlined to us some of the methods which could be adopted to meet the additional demand expected for solid smokeless fuels. In our area, with its large mining population, it is probable that the introduction of smoke-controlled zones will be comparatively slow. As the proportion of our coke sold to domestic users is small, it will be possible, at a cost, to meet the initial demands by diverting sales to the domestic market. An increasing proportion of our base load gas is, however, scheduled to come from coke ovens, so it is unlikely that our production of suitable coke will by itself be able to meet the ultimate demand. One is forced to the conclusion that eventually special plant for the production of this domestic fuel will be required.

If the hopes of Parliament are to be fulfilled, a substantial additional demand for gas must arise particularly during the winter months. It is likely, therefore, that the seasonal load factor will worsen. In our area, where coke ovens supply a large proportion of our requirements, it is not unreasonable in

* From the Chairman's Address to the North of England Section, I.G.E., May 3.

my view to expect them to take some part in meeting this peak demand, and the utilization of lean gas firing at the coke ovens, with the possibility of an increased gas output approaching 40%, almost on demand, has obvious attractions.

The education of young men entering the industry has always been a matter of great concern to the Institution. Only by a sound educational scheme can a steady flow of candidates for membership be ensured. Having had some experience of the complications which have arisen in launching the new Associate Membership examination, I can appreciate the extremely valuable work which has been done by the Board's Student Supervisor during past years.

We are very short of men qualified and content to fill such positions as shift engineers and foremen; men capable of controlling complex plants, and trained to make use of the more accurate and detailed costing data becoming available to us. Too often we have been forced to employ our student engineers on such duties. Admittedly this work forms a valuable and essential part of their training, but the employment of students on these duties cannot give that continuity of control essential to the efficient operation of plant, and very often prevents students from obtaining the full benefit of educational facilities we are happy to provide.

The answer is not easy. It calls for what are referred to in the Government's report on technical education as 'technicians' as distinct from 'technologists,' but as it is estimated that we require five technicians to one technologist, it is a matter which demands our closest attention.

ECONOMIC SURVEY OF THE EASTERN AREA*

By **R. H. EPPS, M.M., A.C.A.**

SECRETARY, SOUTH EASTERN GAS BOARD.

IT is always a good thing to take stock, and having done so it is then permissible to indulge in a little 'crystal gazing.' This I propose to do in the hope that my remarks will stimulate your interest not only in the study of the economy of the area as a whole but in what I believe to be more important to us as individuals—the economic study of local areas.

Thus introducing his address, Mr. Epps proceeded to treat his audience to a most interesting historical and geographical account of what has been described as 'the scarplands and plains of South-Eastern England,' in 7,100 square miles, of which, with a population of approximately 3,389,000, his Board operates. The population per square mile is 478, compared with 762 for the whole of England and Wales.

Approximately three quarters of the population are within reach of gas supplies, and in 1951—the latest census figures available—for every 100 dwellings occupied and vacant there were 67 users of gas. There are of course many rural areas with no gas supply. The estimated proportion of the population within reach of gas supplies varies from 47% in East Suffolk to 94% in Hertfordshire and 100% in Middlesex.

There are five new towns growing up within the Eastern Area whose target population is 275,000, and much progress has been made during the past six years in their establishment. Eventually, if the ultimate objectives of the planners are achieved—namely, to re-deploy the congested population of North London and its suburbs to the healthy and more congenial atmosphere of the Eastern area and to establish industries within the new towns, thus saving travelling time and energy—the benefits to the inhabitants of the new towns will be immeasurable and the Eastern Gas Board should then reap a good harvest.

The number of domestic consumers increased from 622,000 at vesting date to 691,000 at March 31, 1955, but unfortunately over the same period the average sales of gas per domestic consumer declined from 125 to 116 therms per annum. It is obvious that the Board's domestic market is expanding but the problem is to sell more gas to each domestic consumer. The reasons for this decline have not yet, in my personal opinion, been satisfactorily explained.

One of the reasons may well be the greater efficiency of the modern gas appliances.

We have sold over 720,000 gas appliances since vesting date, of which 296,000 were cookers and 234,000 were water heaters. An increase of 9 therms per consumer per annum would result in an increase of £100,000 in our net revenue.

You will appreciate, I am sure, the importance of having as much information as possible about the domestic market. Local information of course is the most valuable and can only be obtained locally; when obtained, it should be used. I can tell you that the average number of rooms per dwelling in the Eastern area is slightly above the average for the whole of England and Wales and that five-roomed dwellings are the most numerous, accounting for 41% of the total, while four-roomed dwellings account for 25%, but the local picture might be quite different. We know that on average over the area only 53% of the households have the exclusive use of a fixed bath, though 75% have exclusive use of a piped water supply. A field of local research which could with advantage be undertaken is to ascertain which of our consumers, having the exclusive use of a bath with a piped water supply, have no gas-operated appliances for heating bath water.

Mr. Epps stated that the picture of the industry in the area was a changing and complicated one. Nearly all aspects of manufacture and development were to be found, but in the main only on a small scale. He continued:—

The Eastern area manufactures for export steel castings, cranes, mechanical stokers, jigs and fixtures, sluice gates (for irrigation schemes), machinery for the sugar beet industry, agricultural machinery, ball-bearings, scientific instruments, radio receivers, television equipment, printed matter, mechanical handling equipment, and flints from the 3,000-year-old flint knapping industry at Brandon, Suffolk. The Gas Board's contribution to the success of these industries is considerable as 23% of our total production is sold to industrial consumers.

Good Prospects

The prospects of economic stability for the Eastern Area are good. The industries which were depressed between the two wars, such as mining, metal manufacture, and textiles, are under-represented in the area. Unemployment in the agricultural industry under present government policy is unlikely, and a steady market for its products is assured.

The diversity of the various engineering products and the fact that industry is so widely dispersed inclines one to the view that although particular types of engineering work might be affected by a decline in the export trade, it is doubtful whether all sections of the engineering industry would be affected at the same time, and this diversity is really the industrial strength of the area.

The high level of income in parts of the area and the relatively high social status of the inhabitants show that there is potentially a future for space-heating and hot water loads.

My conclusion therefore is that the Eastern area would suffer less from a trade recession than other areas. I am fortified in this belief because we have five new towns growing up, large L.C.C. estates and expanding industries. Population follows industry; thus there is a big potential of domestic sales. Let us not forget the Clean Air Bill, for is not gas the best smokeless fuel?

I have briefly touched on the need for market research at local level—the extent, or indeed the programme, I would not attempt to define.

* From an address to the Eastern Junior Gas Association, May 5.

The stars of today . . .

Brigitte Bardot, delightful French star, made her British screen debut opposite Dirk Bogarde in the VistaVision-Technicolor comedy "Doctor At Sea". Adapted from the best-selling novel by Richard Gordon, "Doctor At Sea" is a J. Arthur Rank Organisation release, produced by Betty Box and directed by Ralph Thomas.

. . . are created by public acclaim. Cinema audiences acclaim charming Brigitte Bardot, who starred in the film "Doctor At Sea"—and housewives acclaim the Century Cooker, which features in thousands of modern kitchens throughout the British Isles.

The roles of these two stars in contemporary life are in widely differing fields, but the pre-eminence of both is the result of their fulfilling the exacting demands of their respective roles.

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- ★ Vitreous enamelled surfaces throughout
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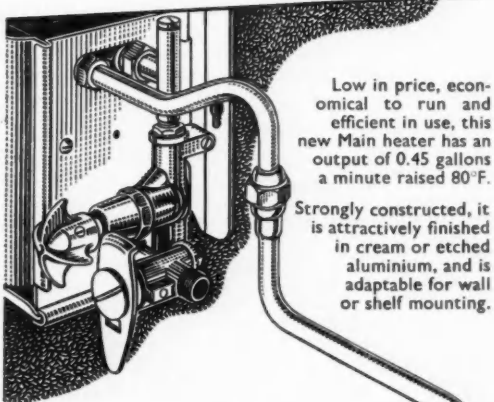

Low in price, economical to run and efficient in use, this new Main heater has an output of 0.45 gallons a minute raised 80°F.

Strongly constructed, it is attractively finished in cream or etched aluminium, and is adaptable for wall or shelf mounting.

ACCESSORIES AVAILABLE

Products deflector ● Swivel outlet spout ● Gas Governor ● Interlocking Gas and Water Cocks complete with gas and water throttles and pilot light

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MAIN WATER HEATERS LTD.

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W 34

Modifications to a Large Holder Station*

By C. G. PARTINGTON, Assoc.M.Inst.Gas E.

THE Princess Street gasworks ceased production in 1946, when it became a major holder station supplying central Blackpool by low pressure, the northern and southern extremities by boosted pressure (up to 3 lb. per sq. in.) in mains of 12 in. to 15 in. diameter, and medium pressure (up to 10 lb. per sq. in.) in 6 in. and 8 in. mains. The whole of the input to the station is by a 30 in. main from the new Marton works some 3½ miles away which is equipped with boosters to supply up to 1 mill. cu.ft. per hour at a pressure of 72 in. w.g. The storage of the station is 2¼ mill. cu.ft. As in many old works, the distribution of gas in three separate streams was accomplished by an assortment of connections between the bulk supply main, holders and plant added as expediency had directed, and leaving many operating difficulties.

After the 1939-45 war Blackpool being fully developed along the sea front, has extended mainly inland giving an opportunity to lay large medium pressure mains from the 30 in. feeder to supply the northern and southern extremities direct, thereby avoiding recompression at Princess Street and making it a practical proposition to lay out Princess Street as a large low pressure holder station. It is the purpose of this paper to give an account of the modifications carried out culminating in the putting to work of an entirely new installation at the centre of a distribution network.

Features Adopted

The main features of the standard pattern of holder station adopted by the North Western Gas Board are:

(1) Controlled input by volumetric governor.
(2) Inferential measurement of input.
(3) Use of an uplift booster to make the whole of the storage effective.
(4) Inferential measurement of station output.
(5) Provision of low pressure alarms on both inlet and outlet mains.

In adapting the ideal layout to suit a specific case it is invariably necessary to condense the pipework into as small a unit as possible, to save space and costly building work. Additionally, in this particular instance it was decided that the installation should be entirely above ground level on a concrete raft due to the nature of the sub-soil—this being the approximate site of the original 'Black pool.' To condense the area of concrete raft required it was decided to put the station governor and non-return valve at high level and further to condense the building, to site them outside. Thus the building would be required only for housing the booster, electric motor and station attendants. At the time orders were placed for large diameter pipework, no choice existed as to material to be used since cast iron was the only material available. The only problems raised by an installation carried out in this way are:

(1) Counterbalance and roller mechanisms of governors need to be protected from blown sand, dust and rain.
(2) Some form of heating should be provided for the station governor to prevent freezing.
(3) All governor auxiliaries, setting controls, etc., should be brought into the building for protection from weather.

The siting of the installation was arranged to be well clear of all existing connections to boosters, compressors, governors, etc., so that on completion the buildings housing this equipment could be completely isolated, gutted and used for other purposes. At the same time, with the number of new connections to be made in a very congested yard, it was necessary to be as close as possible to certain key mains and, in order to achieve good inferential measurement of output through a 30 in. dia. main, to find space to lay 95 ft. of this main without bends, tees, etc.

The method adopted in connecting the new installation to existing mains was to provide each key main with an under-pressure tee and valve (or damper plate) at its point of connection. It was considered that this would be the safest possible method of connection and would enable the existing system to be kept working without interruption during the progress of work which took some months to complete. These under-pressure connections were provided at each holder outlet, on the 24 in. Town Governor Main, on the 14 in. Central Drive governor main, on the 30 in. medium pressure Marton main, and on the 15 in. medium pressure South Shore main (now low pressure).

No such connection was provided on the 12 in. South Shore low pressure main as this main required diversion in any case to permit the primary governor outlet main to be run.

The connecting mains were laid with the aid of a mechanical excavator. Most of the excavated materials was removed from site and the trenches were back-filled with sand owing to the boggy nature of the ground. It was fortunate that over most of the run reasonable load bearing clay was found at trench bottom level. Run lead joints are used in the low pressure pipe work as a fair amount of surplus pipe existed with open lead joints and a number of bends, tees, etc., salvaged from the old production station during its demolition provided a source of specials priced only at the cost of recovery and cleaning. The maximum possible use was made of plain pieces of pipe with collars, which were available, in the underground portion of the work.

Additional valves have been fitted where necessary to enable each primary feeder to be controlled at or near its source—a useful asset when doing maintenance work or making connections to these mains. The new connections on the outlet of the new station governor are arranged so that they all fall to one 30 in. syphon in the centre of the yard, which makes for simple and positive syphon maintenance.

The single-storey building was designed by the Technical and Planning Division of the North Western Gas Board.

The cast iron layout, consisting of a great number of 'special' specials, was designed so that as far as possible patterns would not be made for 'one off' pieces. In conjunction with the ironfounders all tees were made to a standard length of 6 ft. 6 in. with alterations to branch outlets as necessary, and closures were made with short double-flanged pipes. In this way the best possible block price was obtained for the castings.

The booster is of 750,000 cu.ft. per hour capacity with a 6 in. w.g. pressure lift, the 25 h.p. electric motor being in a separate sealed compartment. The instrument panel has four recorders indicating station input, inlet pressure, output, and outlet pressure. In addition liquid pressure gauges show station inlet pressure, booster outlet (governor inlet) pressure, and station outlet pressure.

To complete the panel fitting, a station governor setting knob (operating a spring and cam loaded auxiliary governor) and ship's type clock are provided. All auxiliaries connected with the station governor are located at the rear of the panel. The station governor is impulsed from the downstream side of the orifice plate in the 30 in. town main so that a variable orifice plate differential pressure does not affect the actual pressure on the district.

Protection of Governors

The system of loading allows the station governor to be weight loaded for maximum outlet pressure required, control being by a needle valve and outlet auxiliary governor. The only moving parts requiring to be protected from weather are the spindle extension and centralizing rollers which are necessary on a governor of this size. In this case the protection is simply a copper 'top hat' inverted over the extension spindle and fixed to the governor top plate by dropping slotted holes in the 'brim' over screw heads and turning the cylinder a fraction of a turn to lock it.

The volumetric governor is counterbalanced, so it is not

* From a paper to the Manchester District Junior Association of Gas Engineers, April 11, 1956.

quite so simple to afford protection to the moving parts. It has been achieved, however, by joining together two vertically disposed hollow cylinders with a connecting tunnel, all of sheet copper. The cylinder covering the governor extension spindle has two perspex windows so that the position of the governor valves may be judged. This cylinder and the connecting tunnel have a bottom to them, but the outer vertical cylinder which covers only the outer end of the counterbalance arm and weight carrier is merely brought low enough to discourage the entry of water and dust and is left open.

The volumetric governor does not need protection from freezing. The position is, however, different with the station governor, which is very exposed. Suitable arrangements have, therefore, been made to heat the valves and spindle of this governor, the normal inspection panel being replaced by a copper radiator finned on the inside to improve its heat exchanging characteristics.

Audible warning of low pressure conditions is given to station attendants by twin sets of 12 V motor horns comprising two 'windtones' for the medium pressure inlet and two high-frequency type for district pressure. Current is supplied by a 12 V car battery which is changed regularly. Contact is made by two pressure switches. The inlet is set to operate at 12 in. W.G. and break at 16 in. W.G. The district switch is set to operate at 4 in. W.G. and break at 4.5 in. W.G. No provision is made for manually switching off the district pressure audible alarm, but on the inlet pressure alarm a panel is fitted with push button to switch off the horns, leaving a warning light illuminated while low pressures persist.

Costs

The total cost of the installation was £21,493 resulting in annual charges of some £1,836. Nothing has been added to the prime costs given as the calculation of oncost is often the subject of contention. In examining the costs as shown partly broken down in Table 1 it will be noted that, apart from the cost of design of the installation, supervision and the work done by Board labour, there is little reason why heavy oncosts should be added, as all the remaining work is contract work of some description.

Table 1.—Costs of Modifications to Princess Street Holder Station.

	£
House including heating system, etc.	2,010
Booster, governor, valves, non-return valve, and special castings on installation	11,645
Underpressure connections including valves and drilling	890
Hire of plant including operators' wages	886
Delivered cost of sand and cement for back-filling, etc.	213
Contract labour erecting installation	549
Own labour	1,693
Panel and instruments	485
Mainlaying materials	3,107
Sundries	15
	21,493

Annual charges for depreciation, 4% sinking fund, maintenance and interest £1,836.

The modifications at Princess Street have always been regarded as part of a larger scheme involving the supply of gas to the north of the area via the 24 in. Marton to Cleveleys main, and to the south via the 18 in. Marton to South Shore main, with the Princess Street station looking after Central Blackpool. However, bearing in mind the different dates of setting to work of these three projects some idea of their effectiveness can be deduced. I have chosen to show their effect on total boosting running costs incurred by the Group. Any saving made by the 18 in. main up-to-date must be very small since only the first stage of the project is completed and is neglected, so any savings made so far may be attributed fairly to the 24 in. North Shore main and the Princess Street modification. The 24 in. main was commissioned at the end of September, 1954, and thus did not work to any extent during the September quarter of that year. In comparing costs as between any quarter of 1954 and the same quarter of 1955 allowance has been made for 7% increase in costs during the 12 months and also for an extra 50 mill. cu.ft. of gas per quarter transmitted to Thornton-Cleveleys in 1955, since this works was operating in 1954 and receiving only a marginal supply.

The comparative costs are set out in Table 2. The following are the salient points:

(1) Comparing the September, 1954, quarter with the June, 1954, quarter a saving of 0.012d. per therm is shown, which was due to a small number of district governors being transferred to the 24 in. North Shore main.

Table 2.—Effects of Distribution Capital Expenditure on Boosting Running Costs.
(Costs raised to September, 1955, level).

FYLDE GROUP

Quarter Ended	Output Therms	Total* Boosting Running Costs £	Add 7%	Add 50† mill. cu. ft. at 0.16d. per therm	Total Comparative Cost £	Comparative Cost pence/therm
June 30, 1954	3,351,611	4,469	313	150	4,932	0.353
Sept. 30, 1954	3,584,852	4,624	324	150	5,098	0.341
June 30, 1955	3,522,931	4,254	*Nil*	*Nil*	4,254	0.290
Sept. 30, 1955	3,421,364	3,118	*Nil*	*Nil*	3,118	0.218

* Total boosting running cost is sum of maintenance of plant, cost of power and wages.
† 0.16d. per therm is cost of boosting from production stations only.

(2) Comparison of the June quarters for 1954 and 1955 shows an improvement in 1955 of 0.063d. per therm. This is due to the reduction in boosting pressures generally and transfer of bulk supplies from the old high pressure system to the new 24 in. North Shore main which was in full commission in June, 1955.

(3) Comparison of the September and June quarters of 1955 shows a further improvement of 0.072d. per therm. This is due entirely to the operation of the modifications at Princess Street which have resulted in lower boosting pressures and better use of stock. Further improvements will be made when smaller boosters are installed at Marton to match the new peak load which is now halved in pressure and volume. No credit has been allowed for buildings vacated on a valuable site amounting to some 5,000 sq. ft. or for reduction in duties of station attendants which has allowed them to take over telephonists' duties for emergency service outside normal working hours. Surplus serviceable equipment made available for use in other parts of the area included three Lancashire boilers and two 250,000 cu.ft. per hour modern steam-driven compressors.

Instrumentation as carried out in this installation has permitted a study to be made of output trends from the Princess Street station and the formulation of a policy of load balancing to improve the load factor of the Marton boosters and to make the maximum use of Princess Street storage.

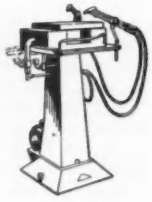
The modifications carried out have effected financial savings, have resulted in much easier operating procedure and have made the distribution system much less vulnerable either from human error or from plant failure. The work has demonstrated the value of instrumentation in day-to-day operation and estimation of consumption trends generally. The degree of safety brought about by flameproof electrical installation, siting of governors in the open air, and absence of valves, etc., under governor house floors is also worthy of note.

Coal Industry in Europe

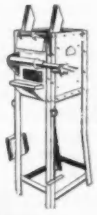
Under the title 'The Coal Industry in Europe,' the O.E.E.C. annual report describes the trend of the coal market during 1955 for the member countries, and reviews the various sectors which contributed to the expansion of consumption—principally the iron and steel industry, followed by electric power stations.

The factors likely to affect the future demand for coal, particularly in the principal consumer sectors, are also studied, and the Committee warns public opinion against the belief that the coal industry might decline as a result of the advent of nuclear energy.

BRITISH ALCOSA PRODUCTS



PF040 FURNACE. The ideal Gas-fired Toolroom Furnace for heat treatment or brazing of small parts. Conversion from Furnace to Brazing Hearth in a few minutes. Complete with Motorized Blower. Extensively used in Technical Colleges.



B 2183 BRASS STAMPING FURNACE. A highly efficient Gas-fired Furnace supplied to world markets with great satisfaction. Suitable for working with Presses from 60-250 tons. Also made for use with propane and calor gas.

Other "Alcosa" Products Include:
BLOWERS, BRAZING EQUIPMENT, GAS & OIL BURNERS, FURNACES, SOLDERING AND TINSMITHS EQUIPMENT, POSITIVE PRESSURE BLOWERS AND FANS, HIGH AND LOW PRESSURES FOR ALL PURPOSES

THE LEADING NAME IN INDUSTRIAL GAS EQUIPMENT

A.H.WILKES & CO.

A Subsidiary of William Allday & Co., Ltd.

Head Office and Works:
"Alcosa" Works, Stourport-on-Severn, Worcestershire.
Telephone: Stourport 311-4 *Telegrams: Yadall, Stourport.*

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price **1/6d.**; by post **1/8d.**

Subscription Rates: Home and Empire:—**60/-** per annum; Foreign:—**70/-** per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at **2/-** per line (approx. **7** words)—minimum charge **10/-**. A Box Number address occupies **2** lines, and a further **6d.** is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received **14** days prior to publication if proofs are required. Type area of inside pages **10** in. deep × **7** in. wide; block screen **120**.

BUSINESS MANAGER: S. T. CULLEN

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN & MIDLANDS REPRESENTATIVE: A. Engelhardt, T.D., 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: FLEet Street 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

Send your enquiries to

GAS PURIFICATION LIMITED

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 7938/9 & 7930

OURS ALONE ?
YES, FACE IT:
FOR 5 MINUTES !

We must fight the Fire Fiend ALONE before the Fire Brigade gets here. Please send details of NU-SWIFT rapid and reliable Fire Extinguishers—BEFORE IT IS TOO LATE !

Name.....
Address.....
Post NOW to Nu-Swift Ltd. 25 Piccadilly W.1.

In Every Ship of the Royal Navy

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *
KETTLE DESCALER

for resale to the public and in bulk for works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.

NATURAL BRITISH.

BOG (DUTCH and DANISH) ORE.

SPENT OXIDE.

LONDON ROAD, LEICESTER.

Telegrams: "BRIPURIMAT"
Telephone: 59086

PUBLICATIONS

GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts, or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

PATENTS

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, A.I.M.E., Patent Agent)
Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

APPOINTMENTS VACANT

TECHNICAL ASSISTANT (FUEL) required by large integrated Iron and Steel Works in the Midlands. Applicants should preferably possess the Higher Grade Certificate of the Institution of Gas Engineers although those with similar qualifications will be considered. Work will consist of general technical control duties associated with the distribution of Blast Furnace and Coke Oven gas together with Holder maintenance and inspection. Organisation and supervision of trials and experiments anywhere in the works will also be involved. The successful applicant will be on the Staff of the Works Fuel Engineer and must fall within the age range 25/35. The housing position is good. Write in first instance, giving age, qualifications, experience to date and salary expected to the Manager of Personnel, Stewarts and Lloyds, Limited, Corby, Northants.

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
VACANCY FOR DISTRICT GASFITTING FOREMAN—KETTERING DISTRICT

APPLICATIONS are invited from suitably qualified persons for the position of DISTRICT GASFITTING FOREMAN, Kettering Sales Unit. Salary within A.P.T. 4A (£535/£615) of the National Salary Scales for Gas Staffs. The post is pensionable, and the successful applicant will be required to pass a medical examination.

Applications stating age and present position, and giving full details of qualifications and experience, together with the names of two referees, should be addressed to reach Mr. D. A. Foster, Group Manager, Commercial Place, Wellingborough, not later than May 31, 1956.

H. B. TAYLOR,
Divisional General Manager.

Leicester.
May 9, 1956.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
CHEMICAL LABORATORY ASSISTANT
(GRIMSBY GROUP)

APPLICATIONS are invited for the position of CHEMICAL LABORATORY ASSISTANT at the Cleethorpes and Grimsby Undertakings.

The successful applicant will be responsible to the Chief Chemist, and will be required to assist him in carrying out various tests and exercising full chemical control. His duties will take him to both the Grimsby and the Cleethorpes Undertakings.

The salary will be within Grade APT. 3 (£390/£575). The position is pensionable, and the successful applicant will be required to pass a medical examination.

Applications, stating age and giving details of education, training and experience together with the names of two referees should be addressed to the Group Manager, East Midlands Gas Board, Sheepfold Street, Grimsby, to arrive not later than Thursday, May 31, 1956.

BERNARD CLARKE,
Divisional General Manager.

SCOTTISH GAS BOARD

ALLOA/STIRLING SUB-GROUP
SALES OFFICER

APPLICATIONS are invited for the above appointment for which candidates should be capable of promoting and co-ordinating sales efforts, organising displays, local publicity, supervising showrooms and district salesmen.

The salary will be within Grade A.P.T. 7 (£670-£750 per annum). The post is pensionable and the successful candidate may be required to pass a medical examination.

A house is available in Alloa at a reasonable rental.

Applications stating age, education, training and experience, together with the names of two referees, should be sent to the undersigned by Friday, June 1, 1956.

W. M. GLEDHILL,
Sub-Group Manager.

Bank Street,
Alloa.

SCOTTISH GAS BOARD

EDINBURGH DIVISION

APPLICATIONS are invited for the following posts:—

(a) TECHNICAL ASSISTANTS (Works).
Salary Scale APT. 7-9 (Provincial 'A') (£670-£855).
(b) TECHNICAL ASSISTANTS (Works).
Salary Scale APT. 2-6 (Provincial 'A') (£385-£690).

For posts (a) applicants should hold the Higher National Certificate in Civil Engineering for Gas Engineers, or an equivalent qualification.

For posts (b) placing within the grades stated will be according to the educational qualifications held.

Applications stating age, qualifications and experience, should be made to the undersigned not later than May 31, 1956.

DAVID BEAVIS,
Divisional Controller,
Edinburgh Division.

Scottish Gas Board,
15, Calton Hill,
Edinburgh, 1.

SCOTTISH GAS BOARD

WESTERN GROUP
PAISLEY DISTRICT
WORKS SUPERINTENDENT

APPLICATIONS are invited for the position of WORKS SUPERINTENDENT in Paisley Gas Works, which has an output of 6 Million Cubic Feet Per Day.

Applicants should have experience of modern production practice in Vertical Retorts, and C.W.G. Plant and of the control of Ancillary Plant, including the installation and maintenance of such plant.

The salary applicable to the post will be within Grade 9 (£755-£855 per annum).

A modern 5 apartment ground-floor flat is available to rent.

The successful candidate may be required to pass a medical examination.

Applications stating age, training, experience and qualifications, including the names of two referees, should be lodged with the undersigned not later than May 26, 1956.

WM. C. CAMPBELL,
District Manager.

District Manager's Office,
27, McKenzie Street,
Paisley.
May 7, 1956.

WEST MIDLANDS GAS BOARD

TECHNICAL ASSISTANT—DEVELOPMENT SECTION

A VACANCY for a TECHNICAL ASSISTANT exists in the Development Section on the Industrial Gas Officer's staff located in Birmingham.

Candidates should preferably have a knowledge of fuel utilisation and possess qualifications in Gas Engineering, Mechanical Engineering or Fuel Technology.

The successful applicant will be required to assist in Development work on experimental and prototype gasheated plant and apparatus.

The salary for the post will be within A.P.T. Grade 5 (£575 x £20—£655 per annum) of the National Salary Scales for Gas Staffs. The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him not later than May 28, 1956.

J. C. INGRAM,
Secretary to the Board.

WALES GAS BOARD

CARDIFF UNDERTAKING
TRAINING CENTRE

APPLICATIONS are invited for the appointment of a full-time LECTURER in Gas Supply subjects to prepare students for the following examinations of the City and Guilds of London Institute:—

(a) Gas Technology (Supply).
(b) Gas Fitting (Intermediate and Final).
(c) Gas Fitting (Practical).

Ability to lecture on the application of Industrial Gas will be an advantage.

The post is pensionable, and the successful applicant will be required to pass a medical examination.

The commencing salary will be within Grade A.P.T. 8/9 (£710-£855 per annum) of the National Salary Scales for Gas Staffs.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Undersigned and posted so as to arrive within fourteen days of the appearance of this advertisement.

J. POWDRILL,
General Manager & Engineer.

Gas Offices,
Bute Terrace,
Cardiff.

WALES GAS BOARD

CARDIFF UNDERTAKING
ASSISTANT DISTRIBUTION ENGINEER

APPLICATIONS are invited for the position of ASSISTANT DISTRIBUTION ENGINEER at the Cardiff Undertaking.

Applicants should possess the Higher Grade Certificate (Supply) of the Institution of Gas Engineers, or equivalent qualifications, and should be experienced in the planning, estimating, and supervision of high and low pressures distribution systems.

The salary will be within Grade A.P.T. 10 Provincial 'A' (£820-£920 per annum) of the scales agreed by the National Joint Council for Gas Staffs.

The successful applicant will be required to undergo a medical examination, and subscribe to the Board's Superannuation Scheme.

Applications, stating age, qualifications, and experience, and giving the names of two referees, should be addressed to the Undersigned, and posted so as to arrive within 14 days of the appearance of this advertisement.

J. POWDRILL,
General Manager and Engineer.

Gas Offices,
Bute Terrace,
Cardiff.

WALES GAS BOARD

CARDIFF UNDERTAKING
TECHNICAL ASSISTANT

APPLICATIONS are invited for the appointment of TECHNICAL ASSISTANT at the Grangetown Gasworks of the Cardiff Undertaking. This Works is undergoing substantial reconstruction and the post offers an excellent opportunity for good experience.

A Liquefied Petroleum Gas Installation is being put down in addition to the existing carbonising and C.W. Gas plants. A 6-million cu.ft. per day Liquid Purification plant has recently been installed, and work commences shortly on the erection of an 8-million cu.ft. per day Gastechnik Purification plant. New compressors are being put in with a total capacity of 15 million cu.ft. per day.

Housing accommodation will be available at a reasonable rental.

The post is pensionable, and the successful applicant will be required to pass a medical examination. The commencing salary will be within Grade A.P.T. 7 (£670-£750 per annum) of the National Salary Scales for Gas Staffs.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Undersigned and posted so as to arrive within fourteen days of the appearance of this advertisement.

J. POWDRILL,
General Manager & Engineer.

Gas Offices,
Bute Terrace,
Cardiff.

(*Classified advertisements continued on page* 502)

There are all sorts of photographs . . .

. . . ranging from furtive to fine art. Whatever sort you want, the answer is always in the negative, if you see what we mean. But if you want *positive* results in industrial photography you could not do better than contact **Walter King Photographs,** 11, Bolt Court, Fleet Street, E.C.4. (Tel. FLEet Street 2236)

WALTER KING WK PHOTOGRAPHS

The sign of BETTER Photograhpy

APPOINTMENTS VACANT (*ctd.*)

GASHOLDER Erection Foreman required, must be fully experienced in the construction of large holders. High rate of pay, attractive bonus scheme and other advantages. Applications giving experience, wage and references to No. 283, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

THE SOUTH YORKSHIRE CHEMICAL WORKS, LTD., PARKGATE, Nr. ROTHERHAM

APPLICATIONS are invited for the position of CHIEF CHEMIST at the above Works. Candidates should have had experience in the carbonisation of Coal and the recovery and treatment of by-products including the rectification of benzole. Experience in testing tar and tar products would be an advantage. The position is pensionable and the person appointed may be required to pass a medical examination. The commencing salary will be according to experience and qualifications and will not be less than £900 per annum. Applications giving details of age, education, qualifications and experience, together with the names and addresses of two Referees should be addressed to reach the undersigned by June 9, 1956.

S. KELLETT,
Joint General Manager.

DISTRIBUTION/UTILIZATION ENGINEER required for Natural Gas Undertaking in WEST PAKISTAN. Must be a well qualified Engineer with good gas distribution experience and prepared to undergo a short course of training in the United States in the specialised field of the Natural Gas Industry. Excellent salary and prospects, pension scheme, full furnished accommodation and medical attention. Only highly qualified men with ambition, initiative and personality should apply. Preferred age 32 to 35. Write full personal details and particulars of qualifications and experience to Box G.J., 249, c/o 191, Gresham House, E.C.2.

NORTH WESTERN GAS BOARD

GROUP TRAINING AND EDUCATION OFFICER

APPLICATIONS are invited for the pensionable appointment of Group Training and Education Officer to the Board's North Cheshire and Mid-Cheshire Groups. The commencing salary will be not less than £1,160 per annum.

Applicants must possess one or more of the following qualifications: a degree in science or technology, corporate membership of a professional institution, technical college teaching experience, and responsible experience in industry.

Further particulars, including details of the responsibilities of Group Training and Education Officers, may be obtained from the Secretary, North Western Gas Board, Bridgewater House, 60, Whitworth Street, Manchester, 1, to whom applications should be returned by June 1.

NORTH THAMES GAS BOARD invites applications from CHEMISTS, who have obtained a First or Second Class Honours Degree, for vacancies at its Chemical By-Products Works, Beckton, East Ham, E.6, for research on problems in connection with coal tar distillation, and the manufacture of phenols, naphthalene and bases.

Preference will be given to those who have had some post-graduate experience in research particularly in subjects related to those mentioned above.

These are permanent appointments and offer good prospects of advancement.

Successful candidates will be required to join the Staff Pension Scheme. Starting salaries will be according to age and qualifications.

Applications, giving age and full details of training and qualifications, should be addressed to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, to reach him by not later than 14 days after the publication of this advertisement, quoting reference 666/288.

Amended Advertisement

EASTERN GAS BOARD

NORWICH DIVISION
WORKS SUPERINTENDENT—KING'S LYNN

APPLICATIONS are invited for the position of Works Superintendent, King's Lynn, at a commencing salary within A.P.T. Grade 9, Provincial 'A' of the National Salary Scales for Gas Staffs.

The Works produces approximately 210 million cubic feet per annum from horizontal retorts and carburetted water gas plants and experience of both these types of plants, together with the ability to control men will be essential qualifications.

There is a house available adjacent to the Works for which a small rent will be charged.

The successful applicant will be required to pass a medical examination and unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, stating age, qualifications and experience, with names of two referees, should be sent to the Divisional General Manager, Eastern Gas Board, Norwich Division, Thorpe Lodge, 1, Yarmouth Road, Norwich, within fourteen days of this advertisement appearing.

EDUCATIONAL

THE UNIVERSITY OF MANCHESTER

GAS PLANT MANUFACTURERS' DEVELOPMENT COUNCIL SCHOLARSHIP

APPLICATIONS are invited for the above Scholarship, tenable for three years from October, 1956. The value of the Scholarship is £350 per annum (less fees), and is not subject to deduction on account of parental income. Candidates must be of British nationality and will be required to read for the degree of B.Sc. or B.Sc.Tech. with Honours in Chemical or Civil or Mechanical Engineering. Preference will be given to candidates already employed in the Gas Plant Industry. Candidates must be nominated by their Headmasters (and, if they are in employment, by their employers also), and selected candidates will be required to attend at the University for interview. The Scholarship Regulations and Forms of Nomination may be obtained from the Registrar, the University, Manchester 13, to whom the forms should be returned not later than July 1, 1956.

The
LIMIT OF EFFICIENCY CAN BE REACHED
by the use of
LUX
GAS PURIFYING MATERIAL

Sole Importers:
HARRISONS (London) LIMITED
66, Mark Lane, LONDON, E.C.3
Telegrams: Birchrock, London *Telephone:* ROYal 3120

DOMESTIC UTILISATION OF GAS
SMITH & LE FEVRE
20/- *inc. postage*
WALTER KING, LTD.
11, Bolt Court, Fleet Street, E.C.4.

STRINGER BROTHERS
ALBION WEST BROMWICH

S.B
IRON & STEEL
PLATES & SHEETS
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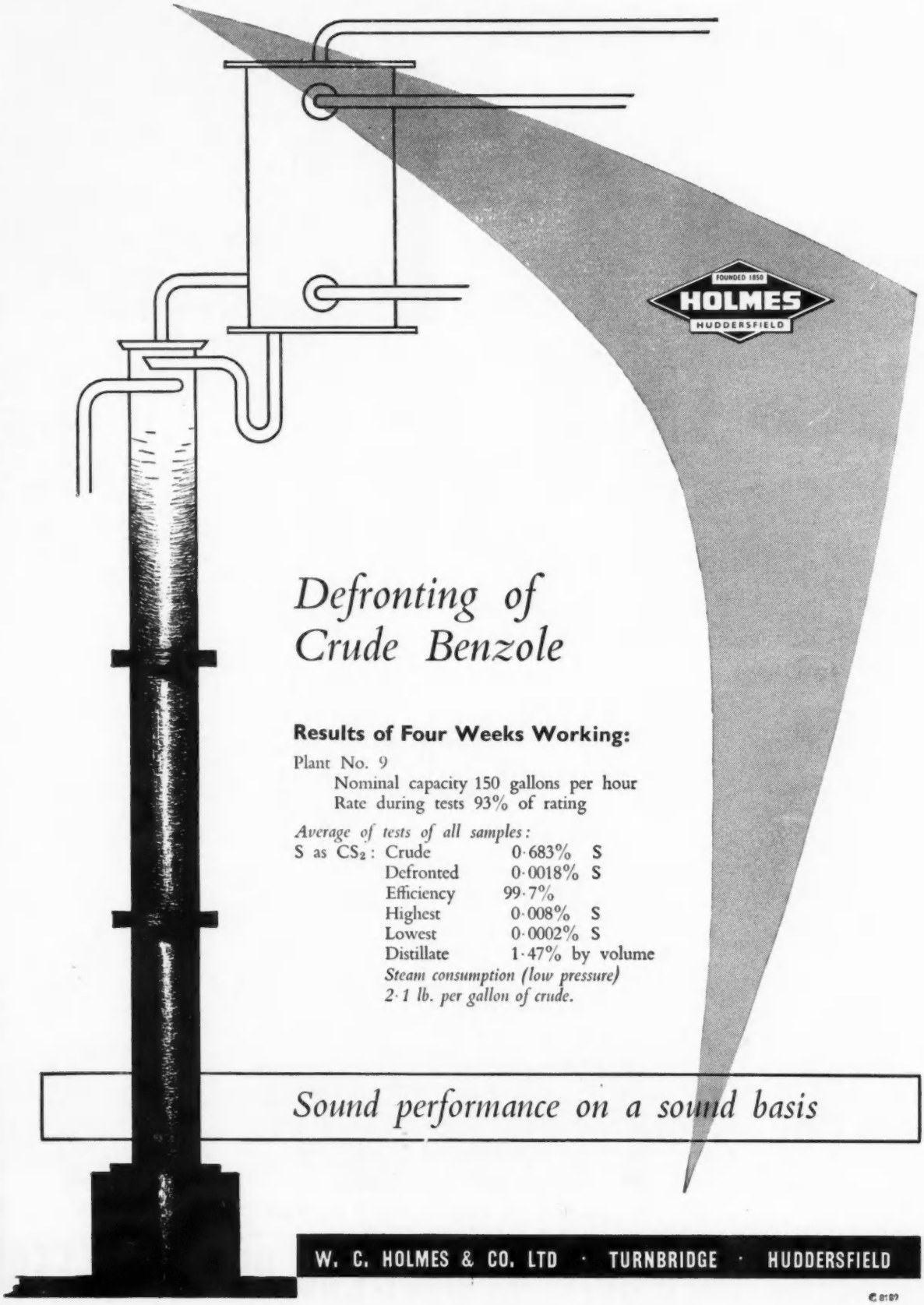
Telephone:
WEST BROMWICH 0436-7



FOUNDED 1850
HOLMES
HUDDERSFIELD

Defronting of Crude Benzole

Results of Four Weeks Working:

Plant No. 9
Nominal capacity 150 gallons per hour
Rate during tests 93% of rating

Average of tests of all samples:

S as CS_2:	Crude	0·683% S
	Defronted	0·0018% S
	Efficiency	99·7%
	Highest	0·008% S
	Lowest	0·0002% S
	Distillate	1·47% by volume

Steam consumption (low pressure)
2·1 lb. per gallon of crude.

Sound performance on a sound basis

W. C. HOLMES & CO. LTD · TURNBRIDGE · HUDDERSFIELD

C 8189

industrial gas compressors

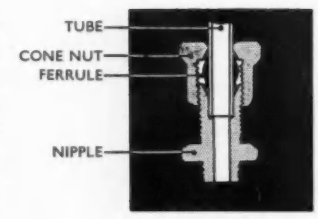
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7¾".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.

TYPE 4 COMPRESSORS (not illustrated) are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.



serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies.
Size Range: 1", 1¼", 1½", 2" and 2½" outlets.
Capacity Range: 45-280 cub. ft. of gas per hour.

Brass non-blow-off head types: deal with 5 to 10 cub. ft. of gas per hour.

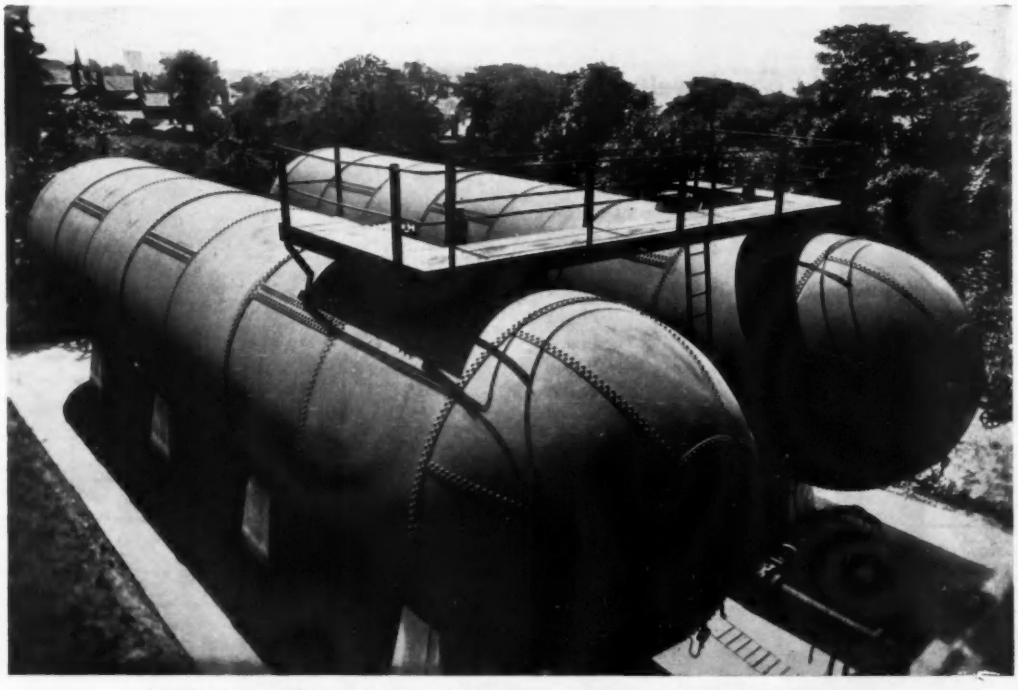
Stainless steel, "F" type head, burner: deals with 8 cub. ft. of gas per hour.

Perforated head type burner: deals with 10 to 15 cub. ft. of gas per hour.

Keith Blackman LIMITED
MILL MEAD ROAD, TOTTENHAM, LONDON, N.17
'Phone: Tottenham 4522 (twelve lines) 'Grams: "Keithblac, Norphone, London"
BRANCH OFFICES AT MANCHESTER, BIRMINGHAM, LEEDS, GLASGOW, NEWCASTLE-ON-TYNE, PENARTH near CARDIFF, AND BELFAST

INDUSTRIAL GAS EQUIPMENT

524

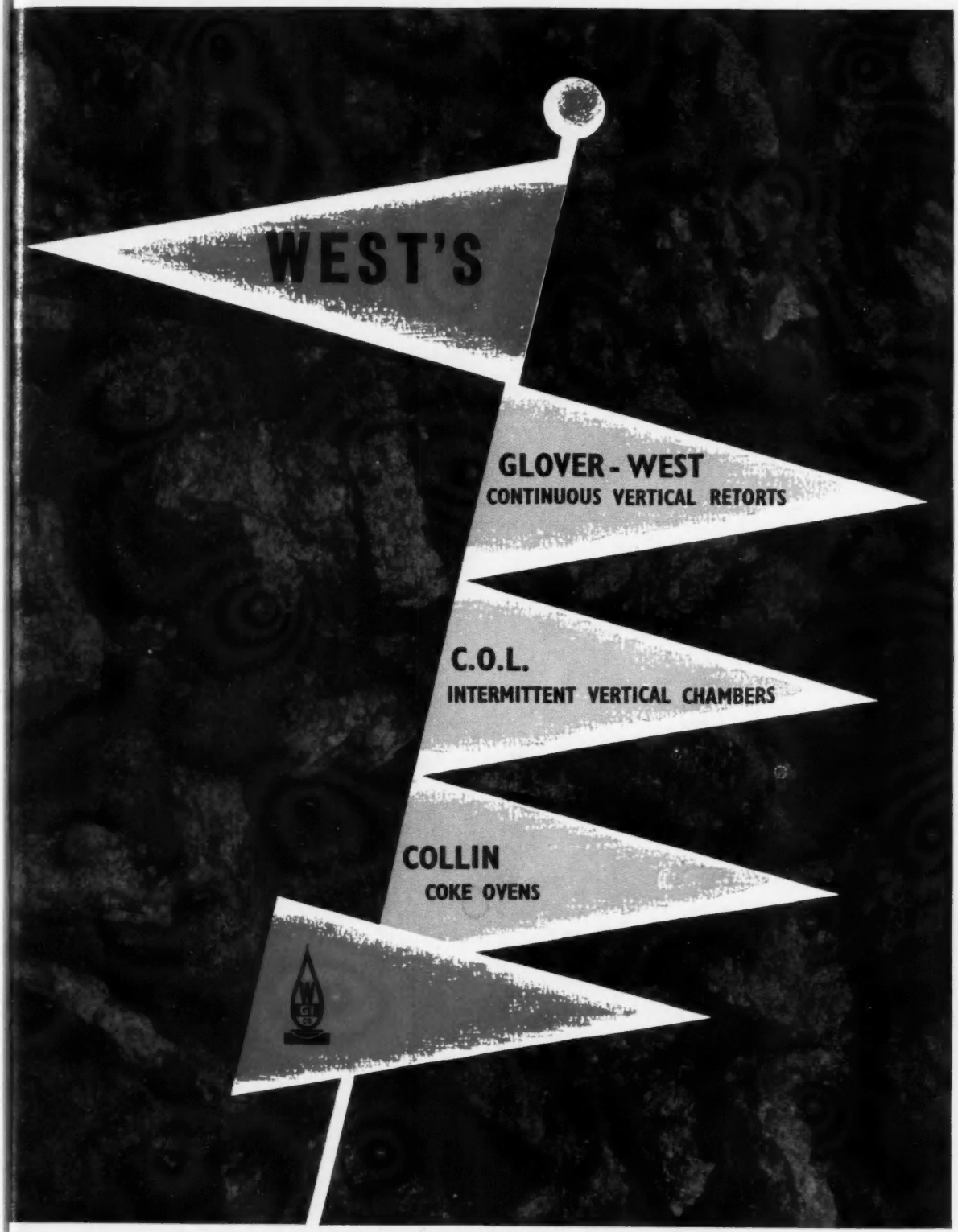


HIGH PRESSURE GASHOLDER INSTALLATION
RIVETED HIGH PRESSURE GASHOLDERS. 60 lb. per sq. in. working pressure

CLAYTON SON & CO. LTD., MOOR END, HUNSLET, LEEDS

187

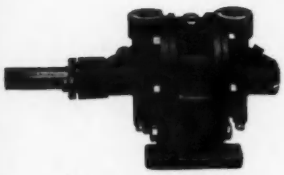
Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2. for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4., Wednesday, May 16, 1956



WEST'S GAS IMPROVEMENT COMPANY LIMITED
MILES PLATTING, MANCHESTER 10 TEL: COLLYHURST 2961 GRAMS: STOKER, MANCHESTER
AND IN LONDON
Columbia House, Aldwych, W.C.2. Tel: HOLborn 4108 C.O.L. Div: Chandos House, Buckingham Gate, S.W.1. Tel : ABBEY 6912
C2

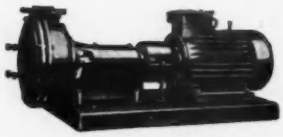
PUMPS AND FILTERS

Filtration Plant

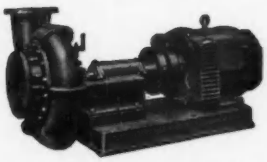


Rotary pump for Oil transfer duties

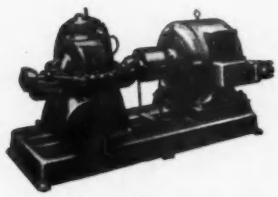
FOR ALL GAS AND ALLIED INDUSTRIES



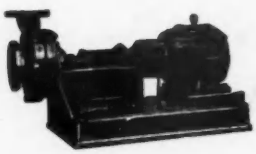
Stoneware pump for Corrosive and chemicals



Slurry pump for coal washing and abrasive liquids.

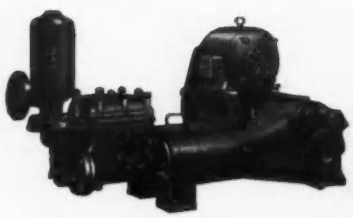


"HS" Type—for water services. All heads up to 500 feet.

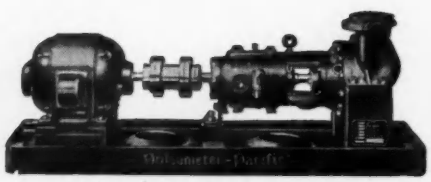


"JA" & "JB" types for high temperature water circulation.

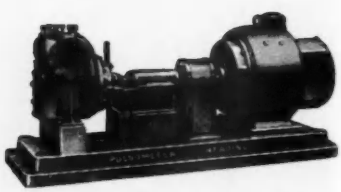
The illustrations show centrifugal pumps for light and heavy oil and liquor duties, stoneware and special metal pumps for handling acids and alkalis, pumps for circulating and washer duties, for clean water and fire services and for liquids containing abrasives.



Reciprocating pump of modern design for Gas Works.



Pulsometer—Pacific type, based on latest American practice.



Self priming centrifugal pumps.

Pulsometer Engineering Co. Ltd.
Nine Elms Ironworks, Reading. Tel: 67182/5

in association with

Joseph Evans & Sons Ltd.
Culwell Works, Wolverhampton. Tel: 20864/6

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